

International Journal of Mass Emergencies and Disasters
August 2015, Vol. 33, No. 2, pp. 253-273.

**How Volunteering Reduced the Impact of the Rena Oil Spill: Community Responses
to an Environmental Disaster**

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Following the Rena oil spill off the Bay of Plenty coast in New Zealand and subsequent volunteer clean-up programme, we interviewed 39 volunteers and 9 people involved in the volunteer organisation. We aimed to learn about people's responses to an environmental disaster, what factors motivate people to volunteer, and how volunteering after a disaster assists individuals and communities to adjust to changing circumstances. The oil spill had an emotional, physical, cultural, social and spiritual impact on both individuals and communities. People were motivated to volunteer from a sense of duty and history of volunteering, a concern and sense of collective responsibility for the environment for current and future generations, a desire to contribute to their community, and to connect with others and cope with their negative responses. There was a strong typical New Zealand "can do" response in that volunteers expressed they had time and capability to help so they just wanted to get on with it. After volunteering, most participants reported a sense of satisfaction, renewed social ties, and renewed optimism. The clean-up programme brought communities together, resulting in timely removal of oil from beaches and coastline and demonstrating that citizen volunteers can contribute to oil spill mitigation.

Keywords: oil spill, volunteer, community, environmental disaster

Introduction

Following the grounding of the MV Rena on Astrolabe Reef about 12 nautical miles from the port of Tauranga, local people expressed outrage about the approximately 350 tonnes of oil and marine diesel that spilled into the ocean and washed ashore along many kilometres of the Bay of Plenty coastline. Maritime New Zealand and the New Zealand Government promised to act to mitigate the oil spill. Advisories to stay off all affected beaches so that authorities could clean up the oil were unheeded as people flocked to the coast to help. Eventually, authorities bowed to public pressure and set up a volunteer programme, so that citizens could assist with the clean-up. More than 7,800 volunteers from around New Zealand, particularly the Bay of Plenty and many who were directly affected, registered; small numbers of volunteers were visitors from overseas. During the oil-spill clean-up, volunteers gave more than 19,000 volunteer hours and collected more than 1,000 tonnes of oily waste (Operation Beach Clean 2011).

Oil spills require specialised clean-up techniques and equipment and are considered hazardous to the health of those involved (Tucker and O'Brien 2011). Initially when the oil from Rena washed ashore authorities expected that heavy machinery would do most of the beach cleaning, and the army became involved. However, it was quickly evident that large numbers of ordinary citizens wished to help, and that the most appropriate activities for volunteers were working by hand on the beaches and rocky shorelines. Even spades and shovels turned out to be of little use, with the most effective tools being small sieves constructed by volunteers themselves using materials available from local hardware shops.

New Zealand has comprehensive “no fault” public insurance in place through the government-owned Accident Compensation Corporation (ACC) to cover personal injury for all residents and visitors to the country. Under this cover people forego their right to sue in the event of injury (www.acc.co.nz). Therefore a culture of litigation has not developed as has occurred in some other countries (McQueen 2009, Tucker and O'Brien 2011). In addition, before the organised volunteer programme began, a comprehensive health and safety plan was written, requiring all volunteers to receive training before being allowed to participate. Decontamination units were established at beach exits to ensure that contaminants were not spread beyond the beach area.

Researchers of the community and social impacts of oil spills such as the Exxon Valdez and Deepwater Horizon have noted that these events resulted in high levels of psychological stress and social and economic disruption for communities and families (Gill, Picou, and Ritchie 2012; Gill and Picou 1997; Ritchie, Gill, and Picou 2011). Impacts were most harmful for those with strong economic, social, and cultural ties to renewable natural resources (Gill et al. 2012; Gill and Picou 1997; Ritchie et al. 2011). Technological disasters were more likely to result in chronic community conflict, poor mental health and various kinds of social disruption than natural disasters (Gill et al.

2012; Gill and Picou 1997; Picou 2011; Ritchie and Gill 2006; Ritchie et al. 2011). Many of the negative impacts were exacerbated by authorities failing to understand or deal with community reactions in a helpful way (Picou 2011).

Following the Exxon Valdez spill in Alaska, local indigenous communities suffered loss of their subsistence life-style (Gill and Picou 1997). Most of the clean-up was carried out by outsiders using heavy machinery. Locals complained that clean-up crews were insensitive to the community, desecrated sacred sites, and left rubbish. Some local people were involved in the clean-up, but Gill and Picou (1997) reported they were "...often given what were considered the more hazardous jobs and made to work in cold water most of the day" (p175). As a result, people experienced chronic stress and continued social disruption. When the Deepwater Horizon explosion occurred in the Gulf of Mexico, outside contractors took over most of the oil spill mitigation and clean up. Locals often felt shut out of clean up processes (Ritchie et al. 2011). Not being able to participate in the clean-up had a negative effect on communities, leading to social upheaval and diminished trust in authorities which affected community wellbeing (Ritchie et al. 2011).

It is likely that the legal system in the United States, which varies from state to state, deters clean-up organizers from using volunteer labour following oil spills. A recent study of risks associated with using volunteers in disaster response in the United States (Sauer et al. 2014) found that organisations deploying volunteers reported a range of practices, with some accepting no legal responsibility for volunteers while others offered limited protection. The Citizen Corps Volunteer Liability Guide (No date) notes a general lack of protection for emergency volunteers, and also reports that spontaneous volunteers not affiliated with an organisation are unlikely to receive injury benefits. This contrasts with New Zealand's public insurance system which offers injury cover to all parties in the event of accident, and preventing personal injury litigation in most circumstances.

The conventional view that citizens respond to disaster with shock and panic is not borne out. Instead, most citizens react responsibly, constructively, and pro-socially (Helsloot and Ruitenberg 2004; Perry and Lindell 2003). Perry and Lindell (2003) noted that the "myth of panic" has been used as an excuse to withhold information from the public, but, rather than panic, people are more likely to converge on disaster areas wanting to help. Similarly, Helsloot and Ruitenberg (2004) found that citizens may be the most effective emergency personnel. All these researchers suggested that incorporating citizen volunteers into emergency planning was likely to be useful.

Emotional connections to particular places that may be damaged in events such as hurricanes and oil spills will affect people's responses (Norris et al. 2008; Ritchie et al. 2011). The resilience of communities following disasters can be enhanced if local people are engaged in mitigation (Norris et al. 2008).

Following disasters, it is common for citizens to volunteer to assist (Lowe and Fothergill 2003; Michel 2007; Norris et al. 2008). Initial responses of shock, grief, fear, and confusion may be alleviated by contributing to disaster mitigation efforts. Volunteers describe “a compelling need to help” (Lowe and Fothergill 2003, p.298), as well as a desire for connection with others (Lowe and Fothergill 2003; Webber and Jones 2011). Volunteers have been found to have altruistic motives, largely because altruism and prosocial behaviour are seen as normative in most cultures (Dass-Brailsford, Thomley, and Hurtado de Mendoza 2011; Mattis et al. 2009; Michel 2007).

People are more likely to volunteer if they believe their contribution will make a difference (Allison, Okun, and Dutridge 2002; Michel 2007); furthermore, women, people with higher education, higher occupational status, and more social integration may be more likely to volunteer (Lee and Brudney 2012; Lowe and Fothergill 2003; Michel 2007).

In most examples of citizen response following the disasters described above, people volunteered to help other people in affected communities. However, people also volunteer to mitigate *environmental* effects. In the case of the *Hebei Spirit* oil spill off the coast of Korea in 2007, where more than 1 million people volunteered to help with the clean-up, people were reportedly motivated by “environmental consciousness” and because they wanted to ensure a healthy environment for future generations (Hur 2012, p.3).

From an ecological-symbolic approach to disasters, a community’s relationship with the environment influences community responses and recovery (Kroll-Smith and Couch, 1990, cited in Ritchie et al. 2011). Communities that depend on environmental resources for their social, cultural, and economic existence are particularly vulnerable to disaster events, thus, it is important to understand people’s relationships to the environment when disasters occur (Ritchie et al. 2011).

Volunteering is a way for communities to cope successfully with a disaster (Grimm, et al. 2007; Halpern 1974; Webber and Jones 2011), because volunteering leads to better mental health and can help to alleviate stress and anxiety (Clukey 2010; Grimm et al. 2007; Halpern 1974; Johnston, Becker, and Paton 2012). Volunteering increases people’s social networks and supports and leads to information, thereby increasing social integration and people’s sense of hope and optimism (Cheong 2011, Halpern 1974, Webber and Jones 2011, Wilson and Musick 1999). Volunteers have reported personal transformation from their participation in disaster recovery efforts (Clukey 2010; Dass-Brailsford et al. 2011), and have reported learning new skills and improving their job chances (Webber and Jones 2011; Wilson and Musick 1999).

However, in some instances, volunteering can increase stress and impact negatively on the mental health of volunteers (Adams 2007; Clukey 2010). For instance, Clukey (2010) reported that volunteers in Hurricanes Katrina and Rita suffered “emotional reactions that included shock, fatigue, anger and grief as well as sleep disturbances” (p.

644). Some people committed a great deal of volunteer time following Australian bushfires leading to burnout, exhaustion, role conflict and reported difficulty in withdrawing or handing over responsibilities to others (Webber and Jones 2011). Even so, volunteering had benefits that mitigated these negative effects, although it was important for volunteers to have social supports and a chance to debrief.

Given that community participation in volunteer activities following disasters can help with reducing anxiety and trauma and provide positive benefits to volunteers (Cheong 2011, Johnston, Becker and Paton 2012, Webber and Jones 2011) it is not surprising that several researchers have suggested that authorities responsible for disaster response need to find ways to make use of community volunteers (Helsloot and Ruitenberg 2004; Johnston et al. 2012; Perry and Lindell 2003). In considering New Zealand examples, Johnston, Becker, and Paton (2012) noted that “[c]ommunity participation allows an outlet for people to articulate and solve problems, empowers them to take action, and as a result assists in reducing anxiety and trauma and helps build resilience to cope with future events” (p. 263).

Because volunteer participation is not always planned for, it can be difficult for authorities to cope with the unexpected influx of helpers following disasters. In the case of oil spill response, some writers have suggested that non-specialist volunteers should only carry out auxiliary tasks, and not be allowed to participate in removal of oil or on-scene operations (McQueen 2009). However, given public and media perceptions, it is often politically useful to include volunteers (Tucker and O’Brien 2011). Volunteers are likely to bring useful skills, although often such skills remain unrecognised, and for volunteer inclusion to be successful, good leadership and management procedures are essential. Managing volunteers presents many challenges and, to be successful, a volunteer management plan should be in place.

Our aims were to learn more about people's responses to an environmental disaster, what factors motivate people to volunteer, and to discover how volunteering after a disaster assists individuals and communities with adjusting to changed circumstances.

Method

Volunteers responding to an on-line survey were asked if they were willing to participate in an interview about their experiences. As a large number of survey respondents indicated a willingness to be interviewed, participants were selected for interview using a stratified-random sampling method. Twenty Māori¹ and 20 non-Māori participants were randomly selected from lists of volunteers. Selected volunteers were interviewed either individually or in a focus group, with some participants interviewed by phone. Nine key informants involved in organising and supporting the volunteer effort were also interviewed, including site supervisors, the regional manager for surf lifesaving, volunteer coordinators, health and safety coordinators, and representatives of

local Māori communities. Interviewers were matched to the gender and ethnicity of participants as far as possible, and participants were offered a choice of interviewer.

We asked volunteers about the impact of the oil spill on their lives and their communities, their motives for volunteering, and their volunteer experience. We probed for information about their levels of hope or optimism prior to and after volunteering including their perception of the usefulness of their contribution.

Key informants were asked about their roles in the volunteer effort, their experience in dealing with the volunteers and their perceptions regarding the feelings of the volunteer groups. They were also asked about the management of the volunteer programme and how this could be improved in future. Findings related to volunteer management are reported elsewhere (Hunt et al. 2014).

Data analysis was carried out by all four members of the research team working together on the transcripts, identifying themes as they arose in the data. The team spent considerable time debating some themes, and discussing nuances in the data. At times there were differing views on the meaning of texts, but for the most part the team reached consensus. When there was disagreement, debate continued until consensus was reached on how to interpret the text. Validation of some of the main themes came from comparison with the findings of other studies; the varied research backgrounds and disciplinary roots of the research team also ensured rich discussion regarding interpretation.

Thematic analysis identified patterns in the data related to the main aims of the project (Braun and Clarke 2006). For key themes, more detailed analysis was carried out to provide a more nuanced and thorough discussion. Themes were identified inductively (i.e. as they arose within the data set) rather than being imposed by previous theory (Braun and Clarke, 2006). Some of the themes were clusters of distinct but related sub-themes. Themes were then reviewed by referring back to the interview transcripts and selecting illustrative quotes.

Ethics

Participants were provided with an information sheet and consent form. They were informed of their right to withdraw from the interview and given the opportunity to ask any questions before giving written consent. A list of service agencies was made available to participants for follow-up support, should this be required.

Participants were offered a \$25 supermarket voucher after completing the interview. Participants did not know of the voucher prior to the interview, therefore it did not serve as an incentive to participate.

Participants' names were known to the researchers, interviewers, and project administrator. However, all information provided in the interviews was stored anonymously and not linked to participants' names. Pseudonyms have been used in all

reports. Audio files were stored on a password-protected server and all research papers were stored in a locked office. Ethical approval for this research was gained from the University of Waikato Human Ethics Committee.

Demographics

Eight male and 31 female volunteers were interviewed. Eighteen volunteers were Pākehā² New Zealanders, 16 identified themselves as Māori, and five as other ethnicities (French, South African, British, and Chinese). Three female and six male key informants participated. Three key informants were Māori, five Pākehā, and one British. Volunteer participants ranged in age from 21 to over 70 years.

Results and Discussion

The findings reported here follow a similar order to that of the interviews, in which participants were first asked about the impact of the oil spill on them and their communities, then about their motivations to volunteer and their experiences of volunteering for beach clean-up. In reporting on the experiences of volunteers, we discuss volunteers' reports and organisers' perceptions, including the impact of volunteering and how volunteering affected people's emotions and met certain needs. We also discuss participants' perceptions of the usefulness of their contributions to the clean-up and some suggestions they made for improvements for the future. Finally we note that the implementation and success of the volunteer programme is likely to be related to aspects of the New Zealand legislative and cultural context.

The Impact of The Rena Oil Spill on People and Communities

When asked about the impact of the Rena oil spill on their lives and communities, participants reported a range of emotional, cultural, spiritual, physical and social impacts. While a few volunteers said that the oil spill had no impact on them personally or had a pragmatic response such as "we live in a port town so two spills in our country is quite good going", most talked about the oil spill having a negative emotional impact on them. They reported feelings that included devastation, depression, shock, anger, grief, disbelief, denial, fear, worry about the environment, the sea-life, and the financial cost of the oil spill.

It downs your spirit quite a lot... I just couldn't stop crying... knowing that it had happened to the beach and seeing it in that state. It even had an effect on my psyche, my identity; you know this... is part of who I am and what I'm proud of.

Some people described the collective grief in their community, with people coming together to share information, and talk about their feelings with one another, even if they had previously not known each other. One person said: “I think it woke people up to a natural disaster on their doorstep, whereas these things tend to happen elsewhere. It was an absolute disaster in every respect.” The grief, anger, and other emotional responses reported by volunteers following the Rena oil spill were similar to the kinds of responses following other oil spills (Gill et al. 2012; Gill and Picou 1997; Picou 2011; Ritchie and Gill 2006; Ritchie et al. 2011).

For some this event had reignited feelings about past events that were not resolved for them:

I think, for us Māori...there's still a lot of hurt and anger about what's been taken, land-wise, anyway. I think it was like, oh great, ruin some more of our beautiful resources. And just not having any control over what goes on.

People reflected on the cultural impacts of the oil spill, and spoke about the oil affecting areas of historical and spiritual interest. Closure of beaches restricted Māori communities along the coast and harbour from having access to their cultural resources, in particular kaimoana (seafood).

It hit significant areas of historical interest and those were spiritually and culturally important.

I would have gone down to the ocean to bless myself, dip myself in. I wouldn't go and bless myself in crusty water.

It was pretty much close to home, you know when you get the paru (dirt) and what's going to happen to our kaimoana and the foodchain and our landscape... yes, it impacted on a lot of people not being able to get seafood.

The cultural and spiritual impacts mirrored those reported by indigenous communities following the Exxon Valdez oil spill, where food resources and subsistence lifestyles were disrupted (Gill and Picou 1997).

Several participants described the spiritual impact of the oil spill on their communities; often strongly linked to the environment. “A lot of karakia (prayer) with my husband and kids, didn't watch the news, tried not to get caught up in the hype, cried.” Many were concerned at the loss of the natural resource for their children and future generations. Connections to the natural environment are very strong for Māori communities in particular. Damage to the natural environment evoked intense feelings of grief and anger due to these connections.

Volunteer participants were concerned that people were not able to go to the beach just as summer was beginning, restricting their opportunities to engage in a range of recreational activities, such as walking on the beach, fishing, and swimming.

The thought of the beaches being contaminated was pretty devastating at the time. We use it a lot for socialising, our spiritual well-being, our fitness...the main reason we live in Tauranga is the sea.

Participants also talked about the negative impact the oil spill had on businesses in the region, in particular, motels and cafes losing business due to fewer tourists and holiday-makers, and fishing boats being unable to fish during this time. However, one person mentioned that some people got work because of the Rena, so there was also a positive impact for some businesses.

People expressed concerns about the use of chemicals to disperse the oil and were worried about the negative impact of oil on their families' health. When the oil came ashore, some people reported the smell was overwhelming and they felt nauseous. Worries about health due to exposure to oil that volunteers expressed were similar to concerns recognised in other studies (Gill et al. 2012; Hur 2012). Participants also talked about a loss of trust in authorities and concern that the public was not receiving accurate information. One person commented: "I definitely feel a certain amount of distrust now between not so much the council, local government, and government officials, but more the whole system in general."

A few noted that people sometimes came together to complain that not enough was being done. Lack of accurate information contributed to people's fear, as initially no one knew how much oil would come ashore, or how long the effects would last.

How People Coped

The volunteers described a number of coping mechanisms. Several found that expressing their emotions helped, and one person reported: "I had a big cry and then I started cleaning up and just got on with it." Volunteers' desire to help following the Rena oil spill supports other findings that citizens are likely to respond with prosocial (helping) behaviour when disasters occur (Helsloot and Ruitenberg 2004; Lowe and Fothergill 2003; Perry and Lindell 2003; Webber and Jones 2011).

Connecting socially and talking about the oil spill to others including family and the community was mentioned by most people as things that helped them cope. However, people also commonly said they needed to do something practical to help manage their feelings. One person commented: "You cope if you actually get down and do something". Some spoke about getting stuck in and just cleaning up. Others spoke of organising support from businesses, encouraging others to volunteer or urging family

members to write to the Prime Minister or others in positions of authority. The expressed need to connect with others and to obtain accurate information about what was happening was also found in other studies (e.g. Lowe and Fothergill 2003). Enhancing social networks and fulfilling information needs have been described as coping mechanisms for people in affected communities (Colten, Hay, and Giancarlo 2012; Lowe and Fothergill 2003; Webber and Jones 2011).

Obtaining accurate information about what was happening was an important coping mechanism for many of the volunteers who read website bulletins and news reports, attended community meetings and tried to find out more about the unfolding situation and what was being done about it. Even volunteers who were overseas at the time of the oil spill commented that they followed updates on the news or internet. As one person put it “Knowledge gave me an understanding and...understanding the extent of the problem diminished my concern.”

A few people said they had to get away from the area for a while to cope with their feelings. A small number of volunteers reported that they “...trusted the experts were doing their bit” and had everything under control so did not have negative responses.

Motivations to Volunteer

The reasons people volunteered were complex and diverse. An often-noted theme among volunteers’ responses was a sense of duty. For example:

The job needed to be done, I don’t believe in sitting back and saying someone ought to do it. It is our beach, we clean it. Don’t talk about, it just do it.

Related to this, others noted that they volunteered because they enjoy helping or that volunteering is part of who they are. One person reported “I would be a real selfish, greedy, lazy person if I just stayed home”.

The New Zealand cultural mindset was seen as a positive factor, since New Zealanders are generally non-litigious and are not risk-averse. Furthermore, New Zealanders pride themselves in having a ‘do-it-yourself’ mentality, which means that people like to do things for themselves rather than wait for experts. This attitude was demonstrated in the immediate influx of people rushing to the beaches to start their own clean-up, in the pressure citizens put on government officials to let them be involved, and in many examples participants gave of volunteers designing their own tools for beach cleaning.

Another saw the Rena oil spill as being a landmark event for the community and wanted to be able to have a role in the recovery effort as a way of placing him/herself in history: “In the future if I ever get married and have kids I would be able to say this

happened in this year and I went down and helped.” Tied into this theme was a sense of belonging to a community who needed to do the clean-up work. Comments included:

Tauranga is home, contributing back to the community.
Someone had to do something... a disaster's happened - you do what you can to help.

Respondents reflected on the importance of maintaining the coastal environment for future generations:

It's our beach, it's what you have to do and I want my grandkids to play and enjoy it.
Helping clean for future generations so food and resources can replenish.

Concern about the environment was reported frequently. People expressed a sense of urgency that the work needed to be done quickly in order to minimise the environmental damage. For example, one person went to the clean-up “(for) environmental reasons, I didn't want the oil to pollute, felt sorry for the wild life.”

As a nation, New Zealanders highly value the natural environment and are proud of what we refer to as our “clean, green image”. This image was threatened by the Rena oil spill; indeed media at the time of the spill reported tourism operators' concerns that tourists who come to the Bay of Plenty because of its pristine natural environment would now choose to go elsewhere. The importance of the environment to the local communities was demonstrated in people's reported grief at not being able to go to the beach for recreation, and in their sense of urgency in wanting to help with cleaning up.

People also reported volunteering because they could, either because they had the time (particularly expressed by retired people), were out of work and available or because they were physically able. As one person said: “...to be involved, because I am available, I have the time and the physical ability and there may be many people out there who aren't available to help.”

Others, who were on welfare benefits or unable to contribute financially to the Rena clean-up effort, said they volunteered in order to be a part of the solution or because they wanted to give back to their community. One participant reported “I don't contribute a lot of money to charities, but I could do this.”

Other people volunteered because they wanted to meet new people or be connected with others. One participant stated that they “...wanted to get alongside and meet people and be social.”

Some volunteered as a way of dealing with emotions such as anger and grief:

I had no choice but to volunteer, I needed somewhere to put the anger that I was feeling.

If you completely barred people from helping, some really bad stuff would have happened. That much negative energy within a community requires a healthy outlet.

The motives identified for volunteering were wide-ranging, from volunteering as a way to deal with emotions generated by the oil spill, to a sense of collective responsibility, through to volunteering for personal benefit, such as being able to use the beach over the summer months, or to assist the local business community.

Volunteers' reported motivations in our study were similar to motives found in other studies. Several studies have found that people volunteer because of a sense of duty or simply because the work needs to be done (Helsloot and Ruitenber 2004; Lowe and Fothergill 2003; Mattis et al. 2009; Michel 2007; Perry and Lindell 2003), or because helping is part of their identity, and because of their community links (Clukey 2010; Lee and Brudney 2012; Lowe and Fothergill 2003). Environmental concerns have also been noted as a motivation to volunteer (Norris et al. 2008).

Michel (2007) noted people who were employed and linked to their communities were more likely to volunteer. However, in our study, some people reported that they volunteered because they were not working and were therefore available to help. Given that our previous survey of volunteers for the Rena clean-up found that over 50% were employed either full- or part-time (Sargisson et al. 2012), it is likely that our findings are similar to those of Michel (2007). It is possible that the interview sample is not representative of all those who volunteered, and contained a larger proportion of people who were not working.

Many also stated they wanted to be linked more to their community. Social motives (Lowe and Fothergill 2003; Michel 2007; Webber and Jones 2011), and volunteering as a way of dealing with emotional responses (Lowe and Fothergill 2003; Ren 2009) have also been reported by others as motives for volunteering.

Impact of Volunteering

When we asked the participants about the personal impact of volunteering, they gave positive responses including feelings of satisfaction at being able to do their bit, feeling heartened by others' contributions to the clean-up effort, being impressed by the number of volunteers and the support received by the public and businesses, and general feelings of pride, admiration, aroha³, and inspiration for communities, and for the importance people place on the environment. Some volunteers found the experience intellectually stimulating and interesting. "Pride, love towards our people, admiration, inspiration, and aroha for the eco-system."

Some volunteers spoke about therapeutic benefits. Volunteering provided some relief and hope and assisted them in working through conflicting emotions, and, at times, even felt relaxing despite the pervading feeling of urgency. Organisers reported that they had noticed volunteers' emotions change from anger and confusion to relief, coupled with a sense of achievement, after their volunteer experience. One organiser likened people's reactions to a grief cycle:

...there was definitely fear when people heard about the boat hitting the reef. Then there was "what's going to happen? How bad is this going to be?" Then there was a bit of frustration and anger developing when people realised that oil was going to come ashore and it was going to have an effect and that it didn't seem like there was much happening to deal with it... and then there was an almost palpable sense of relief and "oh thank god we can do something about this now".

Many volunteers spoke of the positive social aspect to volunteering. They received encouragement from other volunteers, organisers and, in some cases, the public; they met and connected with other people and enjoyed the sense of community. Camaraderie developed between the volunteers:

(I) actually enjoyed the day, relaxing, met other people, out in the sun (it was therapeutic.
Others were really pleased I volunteered; they were like "good on you"
(We were) thanked by strangers on the beach for doing the work
You could feel everyone buoying each other up, supporting each other...huge social aspect....let's do this together...collective purpose.

People in organising roles noticed volunteers benefitting from the social aspects of volunteering. They received positive feedback about the quality of information that the volunteers were receiving, and that the volunteers enjoyed their experience, meeting other volunteers, and felt a sense of community. Organisers noted that the mood of the volunteers changed after they had completed a significant piece of work. They appeared less frustrated and expressed a sense of purpose and achievement when they saw progress being made.

While on the beach, the equipment provided (spades and shovels) was not always suitable for the task of sifting through sand. As a result, some volunteers devised their own clean-up equipment, using materials available from local hardware stores. The large sieves were found to be particularly useful for removing small clumps of oil while leaving behind most of the sand. This example of people designing their own equipment is a typical New Zealand response. New Zealanders often take pride in having a do-it-

yourself attitude; this is considered to be one of our fundamental cultural characteristics (Smale 2013).

Many participants reported positive impacts on communities resulting from the oil spill as people came together to help with the clean up. One person said “it took a disaster to bring everybody together”. There were reports of growth in community spirit as volunteers from both within and outside of communities came together to work to mitigate the effects of the oil spill. Cheong (2011) similarly reported that the volunteer clean-up following the Hebei Spirit oil spill resulted in increased community cohesion and strengthened civil society.

A small number of people reported more negative impacts, and said they felt discouraged and angry when they saw the scope of the problem and wondered if what they were doing made any real difference. Once they began work, fatigue added to their feelings of despair. One person noted:

Huge sense of discouragement, up close and personal. (I) saw the real layers of crap that need to be cleaned up. (I) questioned the value of doing something, picking up the tiny scraps of oil.

The volunteers also commented that they struggled with their feelings towards people who were not volunteering:

There were a lot of people that felt pretty guilty about not being there helping us... it caused a lot of tension in town.
... community friction, some aware and helping, others aware and turning a blind eye.

As a result of community tensions, some people felt hurt, judged and unappreciated. Others were angry at people who they thought could and should be helping but were not. One person described feeling differently about their community afterwards:

...I definitely felt a bit of separation there.... It exposed the rifts in the community. There's those two responses “oh, we're coming together”, “oh we're coming apart”.

Many people commented on the physical nature of the work (volunteers were expected to work 4-hour shifts on the beach on hands and knees, often in hot sun). In spite of protective clothing and supplies of bottled water, people reported that at times they found the work onerous. Participants also expressed concern about the fumes and fear of getting sick, as well as their personal stress levels:

Physically it did affect people, some people got chronic headaches, some people said they had stomach problems after it. But I don't know if it was because of the oil or not. A couple of times we got sick... but we don't know if it was because of the oil or the sun and the oil, because you are out in the field all day.

I was surprised at how much of a physical toll it had taken on me, because my stress levels just went through the roof.

Some communities, particularly iwi groups, had a flexible approach to the hours of work expectation and accepted all people and negotiated hours and tasks to suit their capacities.

Similar to other studies that found volunteering leads to increased hope and optimism (Halpern 1974; Webber and Jones 2011; Wilson and Musick 1999), many volunteers reported feeling more positive after their experience. People reported being impressed with how the community and those in leadership roles worked together to solve the problem, but some noted that they had lost faith in authorities whose role it was to protect the environment. It is likely that media reports, email, and texts reporting on the amount of oily waste volunteers had collected contributed to feelings of optimism.

In summary, the main reported impacts of volunteering were positive, with participants reporting satisfaction and social connection. These findings are similar to those reported by other researchers, who found high levels of satisfaction as a result of volunteering (Clukey 2010; Dass-Brailsford et al. 2011). Our findings were consistent with those from several other studies which found that volunteering had a positive impact on social networks and sense of community (Cheong, 2011; Grimm, Spring, and Dietz 2007; Lowe and Fothergill 2003; Webber and Jones 2011; Wilson and Musick 1999). The importance of communities pulling together to respond to disasters was emphasised by our participants in a similar fashion to Norris et al. (2008) who theorised that such factors would lead to community resilience. Researchers have also reported positive effects of volunteering on various aspects of mental health, such as reducing anxiety and trauma (Halpern 1974; Johnston et al. 2012; Wilson and Musick 1999).

Only a small number of participants in our study reported negative effects on their mental or physical health. In several other studies, more negative effects have been found. For example, following the Hebei Spirit oil spill, researchers reported negative effects on the health of volunteers (Cheong et al 2011; Haraoka et al. 2012; Hur 2012). Similarly following Hurricanes Rita and Katrina, some researchers (Adams 2007; Clukey 2010) reported that many volunteers experienced stress, shock, grief, and sleep disturbances. The difference we found may have been in the scope of the disaster, since the Rena oil spill was much smaller than that of the Hebei Spirit, and did not impact as directly on volunteers' health. Additionally, all Rena volunteers were given training prior

to volunteering, supplied with protective clothing and footwear, and decontaminated as they left the beach which minimised physical health effects.

Suggestions for Improvements

Participants made a number of suggestions for improving the volunteer programme for the future, which are reported here. They also noted that the organisation of the volunteer programme improved over time as organisers gained confidence and became more experienced.

Some volunteers suggested that debriefing after volunteering would have been beneficial, such as an opportunity to give feedback and get further information about the clean-up; others said they would have appreciated personal thanks or acknowledgment for their work: For example:

I never got anything that said thanks for being out there personally, it would be a global thank-you and progress report... wouldn't have minded a personal thank-you.

They should have taken names of the volunteers and that might have helped to get people acknowledged in the media... just an acknowledgement of what people were giving up to do it because it was hard, shitty work.

Some volunteers said that they did not feel the need for more support because being able to volunteer provided them with support. They reported that volunteering had helped them cope with their responses to the oil spill and those who had not volunteered may have missed out on this support.

Yes – hate to think where I would have put my negative energy. Because the experience of volunteering was so positive and empowering, so those who hadn't done that may have needed something.

Yes, because I was part of the community, and helping the environment and even socially and spiritually connecting and doing something with a group of people, so if you didn't volunteer you didn't get it.

Most volunteers agreed that all that was needed was to provide as much information as possible, and one person noted that “as a foreigner I find that the level of emotional support that New Zealand offers is way above my expectations.”

The importance of providing support for volunteers working in disaster situations has been noted by many other researchers (Adams 2007; Clukey 2010; Haraoka et al. 2012; Perry and Lindell 2003). Access to networks and information is considered part of the necessary support for communities (Michel 2007). Lowe and Fothergill (2003) reported

that community-wide disasters, such as the 9/11 attack on the World Trade Center in New York elicited a “therapeutic community response” (p. 309), in which members of the community supported one another. The reports of participants in our study echoed this view.

Conclusion

The Rena oil spill and the subsequent clean-up operations had a substantial impact on both individuals and communities along the Bay of Plenty coast. In global terms, the Rena spill was relatively small, but the local impact was enormous. A positive outcome from the oil spill was that communities came together to help with the clean-up, although in some communities rifts were reported, with some participants directing their frustration and anger at those people who either denied there was oil on the beaches or simply did not help with the clean-up.

People appreciated the opportunity to contribute to the clean-up; in fact many participants intended to do this work anyway, or initiated their own clean-ups. Many were motivated by a sense of duty or a desire to connect with others and contribute to their community. Environmental concerns were also an important motivator. Some said that helping was part of their identity. Furthermore, assisting with the clean-up seemed to be a good fit with New Zealand’s “DIY culture”. The “no fault” public insurance available in New Zealand also meant that volunteers could be involved in the oil-spill clean-up without any possible litigation resulting.

Volunteering for oil spill clean-up was a good experience for most participants, who described a number of positive outcomes. With the oil coming ashore on their beaches, local people reported they felt helpless and vulnerable; volunteering enabled them to take back some control and to deal with their negative emotions. A number of people also reported that participating in the clean-up, either as volunteers or team leaders, enhanced their skills and improved their connections with others in their communities. Several of the key informants described their roles as providing them with useful professional development.

Community building was another important outcome. For those who volunteered, their experiences renewed their sense of belonging to their communities, and a sense of responsibility to contribute and participate. Participating in clean-ups also meant that people obtained information about what was happening and how the clean-up was progressing.

To improve planning for oil spill clean-up, volunteer operations should begin as soon as possible following an event. Support needs to be systematically provided for volunteers, and information needs to be provided in a timely fashion. Volunteers can (and did) perform a variety of roles in oil spill response, therefore, provision for a greater range of volunteer opportunities would be useful.

New Zealand has been fortunate to not have had many serious oil spills near its coastline. The Rena grounding and oil spill has been the largest in recent times. We are a small nation on a global scale, with relatively few resources to devote to oil spill reponse. Because of this, mobilisation of a large public volunteer workforce greatly enhanced the clean-up effort. Several people we talked to stated that they believed that the clean up following the Rena oil spill was the first time that volunteers have been successfully used to clean up after an oil spill. If this is so, then New Zealand, and in particular the clean-up organisers, can potentially contribute useful information to others about the use of volunteers in oil spill response. New Zealand now has a number of its own “experts” who could inform, support, and advise others about best practice for cleaning beaches and shorelines following an oil spill, and also about effective ways of working with volunteers.

Notes

¹Māori are the indigenous people of Aotearoa New Zealand and have strong ancestral links to land and sea and dependence on traditional resources such as kaimoana (seafood)

²New Zealanders of European descent

³Love

Acknowledgements

This research was possible due to grants from the Faculty of Arts and Social Sciences of the University of Waikato and the Bay of Plenty Polytechnic. We thank the interviewees for their time and dedication in responding to the Rena oil spill in our community. We also thank Bay of Plenty Regional Council for their support and assistance.

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