

COMMUNICATION PRACTICES AND SOCIAL
MEDIA USAGE BY GOVERNMENT AGENCIES
AND CITIZENS DURING POST-DISASTER
RECONSTRUCTION

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Declaration

'I, Serena Tagliacozzo, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.'

ABSTRACT

Communication is an essential element in the preparation for, response to and recovery from disasters. Although rapid advancement of new information technologies over the last decade has fuelled academic and practitioners' interest, there has been little research on disaster communications and the role of social media during the long-term post-disaster reconstruction phase (PDR). The originality of this research rests in the fact that it seeks to build theoretical and empirical knowledge about recovery communication processes by government agencies and citizens, which encompass social media-mediated communications. Building on a naturalistic paradigm and a communication ecology perspective, in-depth analyses were conducted in two post-disaster settings: the earthquakes of 2012 in Emilia-Romagna, Italy, and the Canterbury, New Zealand, earthquake of 2011. Various dimensions were factored into the analysis that encompassed the communication system (i.e. sender and receiver of recovery information, channels, targets and potential noises), the specifics of the reconstruction contexts and the culture in which communication activities took place. A mixture of qualitative and quantitative methodology was applied. Once within-case analysis was completed, the findings from the two studies were compared in order to identify common regularities. The comparison revealed that influential factors of recovery communications and social media uses are related to cultural, contextual, social and individual domains but that some practices can be attributed to the demands and peculiarities of the PDR phase. They can therefore potentially be extended to different reconstruction settings. A set of theoretical propositions was derived from the cross-cases comparison and from the interpretation of empirical evidences in the light of academic literature. At the end of the thesis, propositions are organised within a general theoretical framework that outlines characteristics of the communication processes and social media usage during PDR. This dissertation concludes with two models that serve as a thinking tool to guide government officers and citizens in building effective two-way dialogue after disasters.

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Chapter 1

Introduction

Communication processes during post-disaster recovery and reconstruction are, surprisingly, an underexplored area of research. A great many studies (e.g. Perry and Lindell 1997; Garnett and Moore 2010; Smith 2010) mention the importance of two-way communication mechanisms in enabling accountability and community engagement across all the emergency phases. However, these references remain sparse and unsystematic. The few reports (e.g. World Bank 2010; Australian Red Cross 2010) that address specifically this topic are limited to providing high-level guidelines on best practices for recovery agencies. They lack an in-depth analysis of the communications in various post-disaster contexts. In the introduction to the review of the studies published in the journal *Disasters* from the late 1970s onwards, Twigg (2015) noted that recovery research agenda was uneven and inclined towards shelter, housing and resettlement issues. He further noticed the dearth of comparative studies, which would allow for the identification of long-term outcomes of disasters and recovery programs and the role of pre-existing trends in shaping these outcomes. In the introduction to another special issue on disaster recovery of the *International Journal of Mass Emergencies and Disasters*, Reiss (2012) argued that comparative and longitudinal studies are critical for the development of unifying theories of disaster recovery, which seem to be largely absent in the literature.

The lack of knowledge about communication practices during recovery does not necessarily express a lack of interest in the matter. Disaster scholars have paid attention to communication issues since the late 1970s (Hannigan 1976; Scanlon et al. 1978). Over the last decades much research has been published about mass media coverage of disasters (Scanlon et al. 1978; Scanlon 1980; Alexander 1980; Adams 1986) and on information seeking behaviours during disaster response (Nigg 1982;

Turner 1994; Spence et al. 2006). Attention soared with the advent of new communication technologies that enable people to rapidly share and disseminate disaster-related information. Social media or web 2.0 platforms, a type of web-based technology that enables the exchange of user-generated contents (Reuters et al. 2011; Giroux et al. 2013), have opened multiple opportunities for people to engage in disaster preparedness, response and recovery as a collective intelligence (Vieweg et al. 2008; Twigg 2015b) and as partners in knowledge coproduction (Palen et al. 2010). Through continuous engagement and networking, they also have the potential to open the way for better governance and more transparent and engaging communications between government agencies and their constituency (Mergel 2013a, 2015).

Despite a clear general interest, the attention of literature on the communication practices and social media usage seems to deteriorate as the focus shifts to long-term disaster recovery. Central questions remain unexplored. What information do government agencies provide to the affected residents during the reconstruction process? Through which channels? Which social groups are targeted? What information do people affected seek during disaster reconstruction? From which agency and using which channels? How does the communication evolve over the recovery period? How do reconstruction communication practices change across different social and cultural contexts or different kinds of disasters? As published work focused mainly on disaster response and early recovery (e.g. Sutton 2010; Starbird and Palen 2010; Dashti et al. 2014), the role of social media during long-term disaster recovery remains unclear. The opportunities and challenges of using Web 2.0 tools in recovery communications are worth exploring.

One could question the importance of answering these questions as opposed to the urgent need of providing shelters and a functional built environment in the wake of a disaster. Two-way communication mechanisms have been linked in the literature to many positive recovery outcomes, such as the following:

- (a) *Meaningful community engagement.* Giving people the opportunity to have their say during the recovery increases the sense of ownership of the process and their general satisfaction (Kweit and Kweit 2004). It facilitates resettlement (Oliver-Smith 1991) and encourage people's empowerment to act as agents of the recovery (Smith and Birkland 2012).

- (b) *Increased transparency and accountability of recovery agencies.* By engaging in a constant conversation with citizens, recovery agencies can build trust (World Ban, 2010) and increase their accountability toward citizenry. Understanding how recovery agencies communicate means to highlight best practices and pitfalls of the recovery communications. It sheds light on the hidden patterns and underlying factors that influence, for example, favouring certain recovery dimensions or groups over others, and preserving power structures through linguistic and communication means.

Understanding how citizens communicate translates into the adoption of communication with communities (CwC) approach (UNOCHA 2014). In this approach, information is conceived as a form of aid and the information and communication needs of the population are placed at the centre of the aid interventions. The approach has recently spread across many relief agencies and has been applied in various response contexts (CDAC network 2014; Internews 2014; BBC Media Action 2015). However its application within disaster settings remains largely confined to the response stage. In order to derive insights into information needs and communication channels of a population during disaster recovery and ascertain whether communication patterns change across diverse social and demographic groups, this research adopts a 'CwC' strategy.

An in-depth understanding of the communication practices of government agencies and citizens gives the opportunity to generate guidelines for recovery communications grounded in evidence, not only theory. Social media platforms are added to the general picture because they represent

novel technologies that enable two-way communications to be timely and cost-effective. In contrast to many studies on social media and disasters, this research rejects the idea that social media can be studied separately from other forms and channels of communication. People navigate in a *polymedia environment* (Madianou and Miller 2013), where they can choose from a wide range of possible communication means which best suits any specific objective and situation. These channels work in a complementary way, not a competitive one: people can decide to adopt multiple channels to achieve the same objective or to use diverse channels to achieve complementary aspects of an objective. In any case, channels and forms of communications are inherently linked and always intersect to form the communication landscape in which we are immersed. For this reason, the final models presented in this thesis depict social media usage patterns as part of recovery communication practices.

In consideration of the above, the scope of this project is *the investigation of communication practices and social media usage by government agencies and citizens during post-disaster reconstruction (PDR)*. By taking together the perspective of these actors, a more comprehensive overview of what works and what does not can be achieved.

This project fills the gaps and provides original contribution to existing research in that it: (a) explores an understudied aspects of post-disaster reconstruction, (b) responds to the lack of comparative studies (Stallings 1997; Tierney and Oliver-Smith 2012) and theories of recovery (Reiss 2012), and (c) generates a framework and models to guide future studies on post-disaster communications. Thus, for the following reasons, the project advances the knowledge about post-disaster recovery.

- (a) It provides a basis of knowledge of the communication processes and social media usage by government agencies and citizens.
- (b) It harvests evidence - based knowledge through a naturalistic (Lincoln and Guba 1985) and inductive approach (see section 3.2.1 for an

explanation of the characteristics of the naturalistic approach and rationale for using this research).

- (c) Through a comparison of two case studies, it allows for the identification of recurrent communication and social media usage patterns that go beyond the observations of a single case study.
- (d) Through systematic cross-cases comparison, it constructs a theoretical framework and models of the communication practices and social media usage during PDR.

As mentioned above, the study adopts a 'naturalistic' approach (Lincoln and Guba 1985; Phillips 2014) to derive inductively evidence-based knowledge through an in-depth analysis of two post-disaster contexts. In the naturalistic enquiry, social phenomena and human behaviours are studied as they unfold in the social context and through diverse methodologies that allow one to grasp the interactions between actors, and between actors and context (see also section 3.2.1). Thus, I entered the context gathering data and evidence with a variety of research methods, both qualitative and quantitative. The core of my investigation was represented by first-hand insights from key informants (government officers and representatives of community groups) of the post-disaster contexts analysed and the analysis of pre-disaster contextual dynamics. The choice of a naturalistic paradigm was determined by the complex, multifaceted and changing nature of the topic under analysis, namely of the communication processes between government agencies and citizens during the reconstruction process.

A multiple embedded case study design (Yin 1984, 2009) allowed me to confirm and explore emergent patterns. For each case study, multiple levels of analysis were taken into consideration: the communication systemic level (e.g. information source, message, channels, noise and receiver), the contextual level and the cultural level. The procedure suggested by Eisenhardt (1989) to derive theories from case studies research was followed. Each case study was treated as a stand-alone

entity. Once the within case data analysis was completed, cross-cases patterns were researched. Then the emergent frame was constantly compared with case data and with existing literature and theories to strengthen the validity of the findings. The methodology to construct theories from case studies is suitable when “current perspectives seem inadequate because they have little empirical substantiation” (Eisenhardt 1989, p.548). This research projects draws on several streams of literature encompassing studies on disaster recovery and reconstruction, crisis communication and social media usage and e-government. However none of these streams seems to provide appropriate knowledge about recovery communications. Recovery scholarship lacks an investigation of the communication practices and role of social media. Literature on crisis management and communication (Fink 1986; Mitroff 1994; Coombs 2007) tends to depict the recovery phase as the last stage of a cycle in which the crisis is finally resolving. Thus it fails to acknowledge the specific demands and challenges posed by the recovery process. Likewise, the increase of studies of social media usage during disaster response does not necessarily inform us about what happens in the long term. Actors, needs and channels of the communications may shift from one phase to another. Published works on e-government and social media usage by government organisations do not usually focus on situations in which an emergency has occurred. Reconstruction processes offer challenges that may be present also in daily routine – time and resource constraints, public pressure and uncertainty – but that become more evident and heightened in the aftermath of disasters.

Before describing the layout of the dissertation, some caveats are necessary.

The first caveat concerns the use of theoretical frameworks. In theory generated from case study research, previous literature and earlier theories can be used to delineate the research constructs and strengthen the validity of the research findings. However this knowledge is constructed inductively. It does not try to test and confirm pre-formulated hypotheses (Eisenhardt 1989). This research does not seek to formulate hypotheses

from literature and then test them in a post-disaster setting. Instead, it tries to garner a comprehensive overview of the trends and forces that determine communications and social media usage during recovery and then proceed to their abstraction and generalization through cross-case comparison.

The second caveat has to do with the strategy for cross-case comparison and data analysis. Case-oriented strategy (Ragin 1987) makes use of a small number of cases to gain in-depth knowledge of a phenomenon. Cases are treated as whole entities and not as bearers of variables that should be aggregated in order to find causal relationships (Ragin 1997). In case-oriented studies, the researcher looks at the configuration of causes, not at the relationship between an independent and a dependent variable. The analysis is conducted through copious descriptions of the phenomenon rather than through statistical measures (Della Porta 2008).

From the above follows the third caveat pertaining to the final output of this project. The output consists of a framework which summarizes and organizes theoretical propositions derived from recurrent observations in both the case studies. As such, the framework presents several theoretical propositions that relate to the diverse levels of the phenomenon under analysis and offers a deep understanding and some potential explanations of it. The framework is then used as a basis to construct two models (see model 1 and model 2 in the concluding chapter of this dissertation) that describe dimensions and factors, which influence communications and social media usage during post-disaster reconstruction. The framework and models were not used to prove correlations between variables, because the approach, design and methodology of the research did not work toward this outcome. In the design and strategy of multiple case studies, the generalizability of the findings is given by their *replicability* to other settings and not by statistical measures of correlation. The core assumption is that the framework and the related models presented in this dissertation can be replicated in other reconstruction settings. Naturally, theoretical propositions of the framework would need to be tested statistically in future research in order further to confirm the findings from a

variable-oriented perspective.

The last caveat has to do with the terminology used throughout this dissertation.

The first term to be discussed is “reconstruction”. Kates and Pijawka (1977) identified four stages in the recovery phase: response, restoration, reconstruction and community betterment. In this dissertation, the term “*post-disaster reconstruction*” or “*PDR*” is used to refer to the long-term recovery process, which begins once the immediate needs are met and during which a series of actions is undertaken to restore the physical and social environment damaged by a disaster and reduce vulnerabilities. Therefore, the term “reconstruction” refers to a time period rather than to the rebuilding of the physical environment. The term is used to distinguish the long-term recovery phase from the earlier stages of the process, which have received greater attention in the disaster literature. The distinction between the recovery phases is often artificial, as recovery processes do not follow linear patterns (Tierney and Oliver-Smith 2012), stages often overlap (Quarantelli 1989; Berke et al. 1993) and people or localities of the same affected area can find themselves in a different recovery stage (Rubin et al. 1985). However, the distinction proves useful from a research perspective (Smith and Birkland 2012). The definition of the starting timeframe of the reconstruction is made difficult by the consideration that elements of reconstruction should be incorporated in the early interventions during and immediately after a disaster. In the two case studies analyzed, the reconstruction phase was made to start from three months after the earthquakes, which was approximately the time at which a recovery agency was set up to coordinate reconstruction efforts. In their account of the recovery from Hurricane Hugo in the West Indies, Berke and Wenger (1991) also reported that the restoration stage lasted until three months after the storm. However it is acknowledged that the pace of the recovery phase may vary from disaster to disaster and between localities.

Other terms frequently mentioned in this dissertation are “authority” or “authorities” and “citizen(s)”. My definition of authority, built on the one provided by Weber (1958), argues that rational-legal authority can be distinguished from traditional and charismatic authority. Rational-legal authority derives its power by formal rules and laws established by the State. In post-disaster scenarios, the authority can be represented by government agencies at local, regional and national level tasked with the management of the reconstruction process. As a result, I have defined as 'citizens' or “residents” the individuals (or groups of individuals) affected by a disaster upon whose behalf the power of authority is exerted. The general definition was slightly changed for the second of the two case studies analysed – the Canterbury earthquakes of 2010 and 2011 in New Zealand. This change was necessary in order to accommodate the particular nature of this case study. Indeed during the Canterbury recovery, public-private partnerships were created in order to manage recovery aspects. This resulted in the blurring of the boundaries between private companies (i.e. repair companies) and government agencies.

As this research dwells specifically on communication between authorities, understood as government agencies, and citizens, it makes frequent use of the terms “Government to Citizens” (G2C) and “Citizens to Government” (C2G) communications. However, especially for the citizens, other recovery actors (e.g. citizen groups) came up as information sources during the investigation. As such, from place to place the attention shifts to the communications between citizens and these actors that work beside, and sometimes in competition with, recovery agencies.

Lastly, as often happens in the literature, the term “social media”, “new media” and “web 2.0” are used interchangeably to refer to web tools that allow the creation and exchange of contents between users (Kavanaugh et al. 2012). Examples of social media may include social networking sites such as Facebook, as well as forums, blogs, image-sharing media and micro-blogging sites.

The structure of this dissertation is as follows.

The second chapter presents a brief literature review of relevant themes on disaster recovery and reconstruction, crisis communication and social media usage during and after disasters. The chapter further discusses what we know about recovery communications and which are the best practices highlighted in the literature.

The third chapter describes the research paradigm, and the approach, design and methodology. It offers an overview of the theoretical frameworks that helped to guide the interpretation of the findings. The last section discusses the ethical implications of the research and the process of ethical approval.

The fourth and fifth chapters describe the two case studies: the Emilia-Romagna earthquakes (Italy, 2012) and the Canterbury earthquakes (New Zealand, 2010, 2011). For each case study, reconstruction actors and events have been investigated, along with pre-existing communication dynamics in the context and communication initiatives that took place during the recovery. In so doing, old and new trends are examined that shape communication practices and social media usage.

The sixth chapter builds on the procedure suggested by the literature on comparative methodology (Ragin 1987; Kaarbo and Beasley 1999; George and Bennet 2005) and on theory generation from case study research (Eisenhardt 1989; Eisenhardt and Graebner 2007), to perform a systematic comparison of the findings from the two case studies. Recurrent observations are noted and then framed within the extant literature and theories. From the analysis, a series of theoretical propositions emerge which are then related to the dimensions of the recovery communication system. The resultant framework depicts characteristics and influences of the communication practices and social media usage during PDR at systemic, contextual and cultural levels.

Lastly in the conclusions I constructed two models, which elaborate on the dimensions and influencing factors of the communications and social media usage during PDR. The chapter further shows how the models and

the framework respond to the central research questions of this project and the new research questions that they open up.

Chapter 2

Setting the stage: existing knowledge and gaps in research

2.1. A survey of the main components, actors and issues of post-disaster reconstruction (PDR)

Despite an increase in studies of post-disaster reconstruction (PDR) in the last decade (Yi and Yang 2014), it is widely acknowledged that recovery and reconstruction have received less attention in the academic literature (Rubin 1991; Berke et al. 1993; Smith and Wenger 2006) and national policies (Garnett and Moore 2010) compared to the other phases of the emergency cycle (mitigation, preparedness and response). Besides a general tendency to take a short-term view (Hill and Gaillard 2013), it can be argued that this is the case also due to a lack of agreement on how this phase should be defined. The hiatus extends from the lack of a shared terminology to the lack of a definition of the timeframes and goals of reconstruction.

As for the terminology, Quarantelli (1999) noted that disaster recovery has been conceptualized in several ways over time, depending on which dimensions of the process have been stressed. For example, the term “reconstruction” puts the focus on the rebuilding of physical structures, while “restoration” and “rehabilitation” referred to the need, respectively, to re-establish pre-impact physical and social patterns or to raise the level of the system to a less vulnerable state. Conflicts over terminology also extend into the models that define timeframes. In the model by Kates and Pijawka (1977) the term reconstruction was used to indicate a phase of the recovery process that followed the emergency and restoration stages (figure 2.1). Similarly the model proposed by Alexander (2000) to account for the expenditures on houses after disaster used “reconstruction” in terms of a time period rather than of a set of activities centred on the physical rebuilding (figure 2.2).

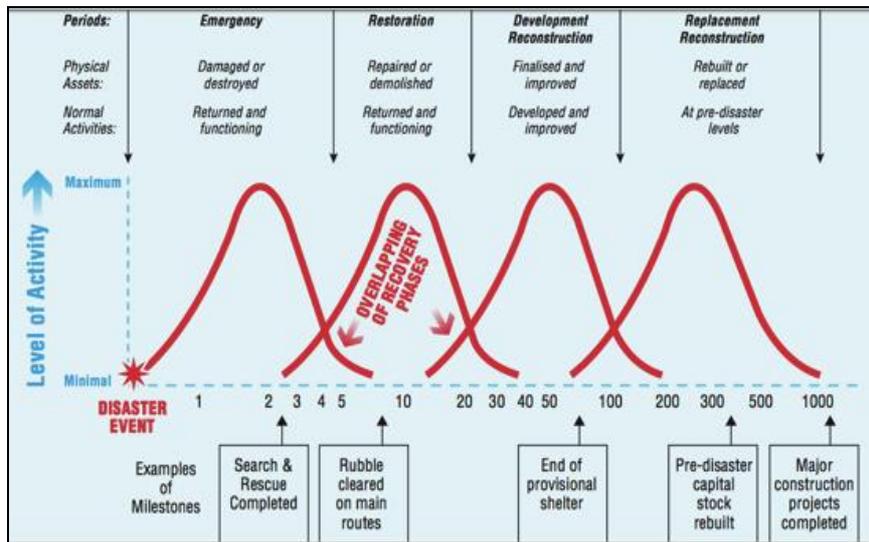


Figure 2.1. Model of recovery process by Kates and Pijawka (1977). A fully successful disaster reconstruction requires that the physical, social and economic environment is reconstructed to safer and more equal standards than pre-disaster levels. Source: Davis and Alexander (2016, p.69)

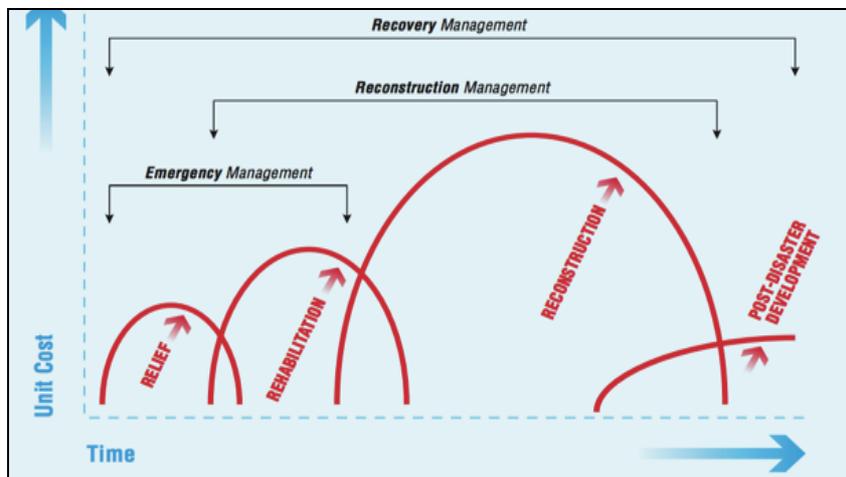


Figure 2.2. Model of recovery by Alexander (2000). The reconstruction phase follows the relief and rehabilitation phase and can last ten years or more. The boundaries between reconstruction process and post-disaster development blur. Source: Davis and Alexander (2016, p.71)

The staged models attracted several criticisms, as authors have advocated that disaster recovery should be intended as a *social process* rather than a sequence of pre-determined stages (Nigg 1995; Rubin et al. 1985; Mileti 1999). They have also argued that the stages may overlap (Berke et al.

1993; Schwab et al. 1998, Tierney and Oliver-Smith 2012). In addition, reconstruction can proceed at different paces depending on one's socio-economic status, on the severity of the damage experienced and on pre-existing dynamics and vulnerabilities in the geographical area or within the community (Nigg 1995; Quarantelli 1999; Fothergill et al. 1999; Springgate et al. 2009; Tierney and Oliver-Smith 2012). Indeed disasters are known to exacerbate and accelerate pre-disaster trajectories and social inequalities (Fothergill and Peek 2004). Thus, reconstruction processes rarely follow neat linear patterns (Tierney and Oliver-Smith 2012).

In this respect, Lindell (2013) suggested that we should think of recovery simultaneously as a process, a phase and a goal. He proposed that recovery consist of four functions. In his model, the term "reconstruction" refers to a function that encompasses the implementation of the reconstruction of the disaster impact area and the management of "the disaster's psychological, demographic, economic, and political impacts" (Lindell 2013, p. 816). As mentioned in the introduction to this thesis, the focus of this research lies in communication during reconstruction, *understood as a phase or a function of the whole recovery process.*

Timescales and terminology are in turn largely influenced by the definition of the goals of reconstruction, namely what the process should achieve in order to be deemed successful or complete (Olshansky 2005). The attention paid in academic literature and governmental policies to housing and infrastructure (Twigg 2015a) seems to suggest a focus on the physical reconstruction at the expense of other dimensions. Despite this, many authors have voiced the need to address reconstruction as a holistic process (Philipsborn 2005), including both the physical and human dimensions (Chandra and Acosta 2010). Social dimensions, notably the extent of social support and the type of social capital one can rely on, are believed to affect in great measure the speed of recovery (Aldrich 2010; Ganapati 2012). Thus, strategies should aim at reconstructing and reinforcing social infrastructures, along with physical ones (Aldrich 2010).

Some definitions of disaster recovery and reconstruction have implied that

the whole process has to be geared towards the restoration of the pre-disaster level (de Ville de Goyet 2008). However, a completely different perspective advocates that reconstruction should reduce social and physical vulnerabilities, which are the ultimate cause of disasters (Alexander 2004; Hill and Gaillard 2013). Disasters trigger major changes across institutional, political, social, environmental and economic domains (Birkman et al. 2010). These changes may have either progressive or regressive outcomes that manifest more clearly in formal responses (i.e. policy innovation) than in informal ones (i.e. social learning). Potential trajectories of disaster-related changes are manifold and positive changes should be promoted (Birkman et al. 2010). Examples of positive outcomes can include catalysing social change (Hastie 1997; Oosters 2005), opening space for renegotiation of the power between the state and the citizens (Pelling and Dill 2010; Aldrich 2013) and boosting technological and economic innovations (Webb et al. 2002; Hallegatte and Dumas 2009). From this, it follows that disaster-related changes represent a “window of opportunity” (Stehr 2001; Smith and Wenger; 2006, Birkman et al. 2010) to rebuild the physical system to safer standards, reduce vulnerabilities in the social system by promoting social equity and justice and mitigate environmental risks.

Recent literature on the reconstruction phase has made use of the term “build back better” (Lloyd-Jones 2006; Lyons 2009) to refer to the development opportunity offered by the impact of a disaster. Kennedy et al. (2009), among others, have challenged this term by pointing out that it is open to several interpretations. They ask what we mean by “better” and prefer the expression “build back safer,” which gives a clearer goal to achieve. These considerations have led to the revision of the concept of resilience as the ability of a system, not merely to 'bounce back' after a strong negative event (such as a disaster), but also to 'bounce forward' and overcome its limitations and vulnerabilities (Manyena et al. 2011; Alexander 2013).

From the above it follows that a successful reconstruction process incorporates elements of risk mitigation and sustainable development.

However, this consideration may lead to confusion as to whether the process should be taken over by emergency management agencies, government officials or development organizations. In reality, as I shall explain in detail later, reconstruction should be addressed as a concerted effort by multiple actors (Le Masurier et al. 2006). Multiple goals have to be set and pursued right from the start (Hayashi 2007).

In the next sub-sections I will briefly outline the main components of reconstruction governance, the actors involved and the issues they face in managing this process. I will then explain why a successful reconstruction process has to be inclusive and engage the communities affected and how community engagement requires communication mechanisms and strategies to be implemented.

2.1.1. Recovery and reconstruction governance

It is safe to say that good reconstruction governance begins before disaster strikes. Indeed prerequisites for strong leadership should be set beforehand by establishing relationships between agencies, as well as their roles and responsibilities. Stehr (2001) argued that disaster reconstruction is primarily an organizational issue, in that its characteristics depend on intergovernmental and inter-organizational relationships created before and during the disaster. On the same point, Berke et al. (1993) elaborated a framework for recovery, focusing attention on inter- and intra- community relationships and identifying different types of community (which are also likely to achieve different levels of recovery) according to their horizontal and vertical relationships and the degree of integration between them.

Pre-disaster recovery planning enables the productive management of existing intra- and inter-agencies networks and partnerships and the ad-hoc creation of new ones during the reconstruction period (Smith 2011; Wu and Lindell 2004). It also enables people to set goals and prepare resources for the reconstruction (Smith 2011) without the time pressure that characterizes the period after an emergency. For example, in a

comparative study between Los Angeles (USA) and Taichung county (Taiwan) Wu and Lindell (2004) found that the presence of pre-impact plans facilitated housing reconstruction and long-term disaster risk reduction initiatives. For coordination to be achieved, strong leadership is necessary. Lessons learned from previous reconstruction processes suggest that a lead agency has to be set up soon after the disaster to take charge of reconstruction coordination and management tasks (Johnson 2014; GFDRR 2015). Apart from the coordination of multiple actors and agencies at various levels, the lead recovery agency is needed for various other tasks, including: (a) establishing a vision for the reconstruction, including feasible short term and long-term goals; (b) allocating resources so that these goals can be achieved in the proposed timeframes; (c) setting up institutional arrangements, (d) reducing systemic vulnerabilities by rendering the process as inclusive as possible and by rebuilding to safer standards; (e) addressing community recovery in an holistic manner by ensuring that the recovery of all the sectors (social, physical, economic, technological, etc.) is adequately supported and no sector is left behind; and (f) managing the population's expectancies and engaging the community in decision making.

Disaster recovery frameworks, such as the National Disaster Recovery Framework in the USA (NDRF—FEMA 2011), guide agencies and other actors involved in reconstruction efforts as they address the tasks mentioned above (GFDRR 2015). A disaster recovery framework starts out with the articulation of a vision for recovery and the areas to prioritize. These areas are usually identified through the methods and instruments of post-disaster needs assessment (PDNA). Guiding principles allow one to establish pathways to achieve short-, medium- and long-term goals and criteria to monitor and evaluate the strategies that are implemented (GFDRR 2015). They also allow for multiple-tier governmental coordination under the umbrella of a shared vision and regardless of potential conflicts between each agency's goals and activities (Johnson 2014). Good coordination ensures that institutional arrangements are set up immediately after disaster (if not before) in order to assign roles and

responsibilities and develop policy frameworks for recovery (GFDRR 2015). Coordination mechanisms have to be implemented both vertically, namely across levels of governance, and horizontally, across different sectors (Asian Development Bank 2015).

A common element that every recovery vision should incorporate is the reduction of disaster risks. This can only be achieved through plans and policies that aim at long-term sustainable development, inclusive governance and the reduction of social inequality. Inclusive governance means guaranteeing that underrepresented and marginalized groups such as people with disabilities or ethnic minorities can voice their opinions and concerns and influence reconstruction plans (FEMA 2011). It also means that reconstruction must be a concerted effort and that all the social actors (governmental agencies, NGOs, private companies, grassroots organizations, private citizens etc.) work together toward shared objectives.

Resource allocation is a shared concern of all the recovery agencies, and one that extends from the provision of funding to the training of the workforce (Olshansky 2005). In order to adapt to the evolving and different needs, both across time and the geographic area affected, funding systems and organizational structural have to be flexible (FEMA 2011). Wherever possible, diversified funding sources should be identified (GFDRR 2015). A fair and reasoned allocation of resources guarantees that no dimension lags behind and that the recovery of the system is approached as a whole. Figure 2.3 shows the dimensions that recovery agencies need to look after. As shown, recovery is a multidimensional process, which should encompass physical, economic, psychosocial, environmental and institutional aspects. For each dimension, recovery levels can lie anywhere between the complete absence of recovery and a recovery that incorporates sustainable and equal development measures.

Evidently, when analysing and addressing the recovery process, one should always remember that the dimensions represented above are profoundly intertwined and that the recovery's characteristics are

dependent upon the interfaces between them (Tierney and Oliver-Smith 2012). In fact, disaster recovery and reconstruction take a complex and massive effort that can require years to be completed. Thus, setting realistic targets and managing expectancies of the population affected is one of the major tasks that recovery agencies have to deal with (Asian Development Bank 2015). The consequences of poorly managed community expectations are well exemplified by the rehabilitation and reconstruction in Banda Aceh after the 2004 tsunami. In this case, ambitious plans and pledges by government organisations, international NGOs and donors generated unrealistically high expectations among local communities about length and modalities of reconstruction and conflicts over recovery planning (Jayasuriya and McCawley 2010). Properly designed public information and consultation campaigns and collaboration with community stakeholders help set expectations at an achievable standard (FEMA 2011; GFDRR 2015).

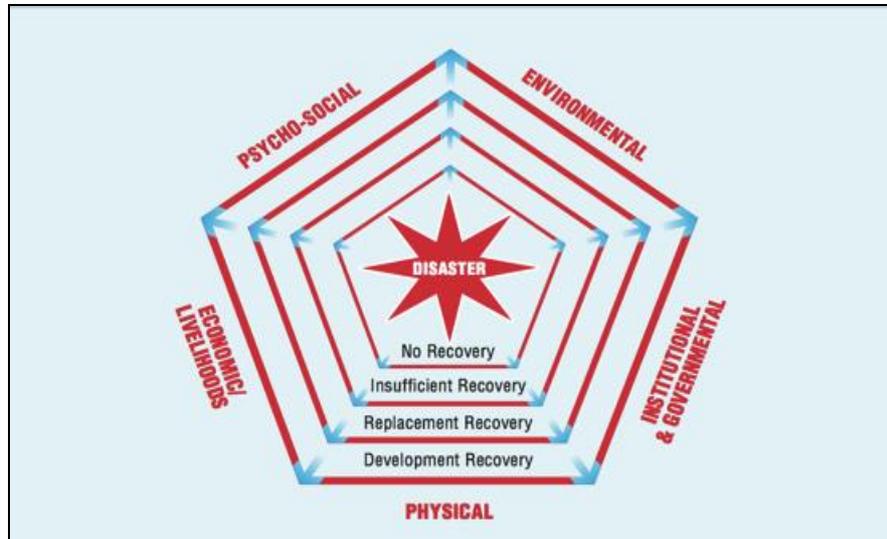


Figure 2.3. Dimensions of recovery. Source: Davis and Alexander (2016, p. 59).

As I shall explain, communications about reconstruction should be clear and transparent. They should find a balance between highlighting positive achievements and progress and explaining the rationale for long timings

and slow procedures. Feedback mechanisms also need to be implemented to revise communication strategies according to the population's information needs (World Bank 2010). Rather than merely being informed about the decisions taken, people should be given the chance to express their opinions, and community inputs should be fully incorporated into the final reconstruction plans (Johnson and Olshansky 2013, GFDRR 2015 Asia Development Bank 2015)

2.1.2. Actors in the reconstruction landscape

In order to assist and support recovery efforts, it is advisable that policy frameworks be designed before and enforced after a disaster. In addition to policy making, entirely new agencies may be established soon after a disaster in order to coordinate agencies and organisations involved in the reconstruction (BRR 2009). The governmental interface may therefore adapt and respond to the challenges placed by the reconstruction process: old agencies may take over new responsibilities while new entities are set up to ensure stakeholders' coordination, policy implementation and long-term recovery planning. Examples of the latter may include the National Reconstruction Agency created after the Great Tōhoku earthquake in Japan in 2011, the Agency for Rehabilitation and Reconstruction (BRR) established in Indonesia after the tsunami of 2004, and the Canterbury Earthquake Recovery Authority (CERA) set up in New Zealand to coordinate recovery activities after the Canterbury earthquakes of September 2010 and February 2011. In many cases, these coordinating agencies are provided with exceptional powers. This decision often has the stated objective to enable leading agencies to bypass bureaucratic procedures and expedite recovery activities. In reality, things may work differently and leading agencies may reinforce the power of central government entities at the expense of local actors and population. As an example, New Zealand Government assigned major powers to CERA after the Canterbury earthquakes. This choice was however criticised by some for having facilitated a centralisation of the whole recovery process (Johnson and Mamula-Seadon 2014). In other cases, existing governmental structures and roles may be adapted or expanded to take

over recovery management activities (Johnson and Olshansky 2013). This happened for example in Chile after the earthquake in 2010 as well as in the recovery phase from the Emilia-Romagna earthquake occurred in Northern Italy in 2012. In this last case, the President of the Regional Council was appointed Special Commissioner of the Reconstruction and the mayors of the municipalities affected took on the role of sub-commissioners. Whatever the institutional form chosen to manage reconstruction, vertical and horizontal coordination remain a critical component of good management. Collaboration and communication among institutional levels has to inform the design of reconstruction plans in such a manner that they are flexible and adaptable to the needs of each specific levels (figure 2.4). However, a common recovery vision should be maintained. Studies show that local governments are critical to successful recovery (Olshansky et al. 2006). Indeed, they bear the burden of managing several recovery activities and of partnerships with local stakeholders (Stehr 2001).

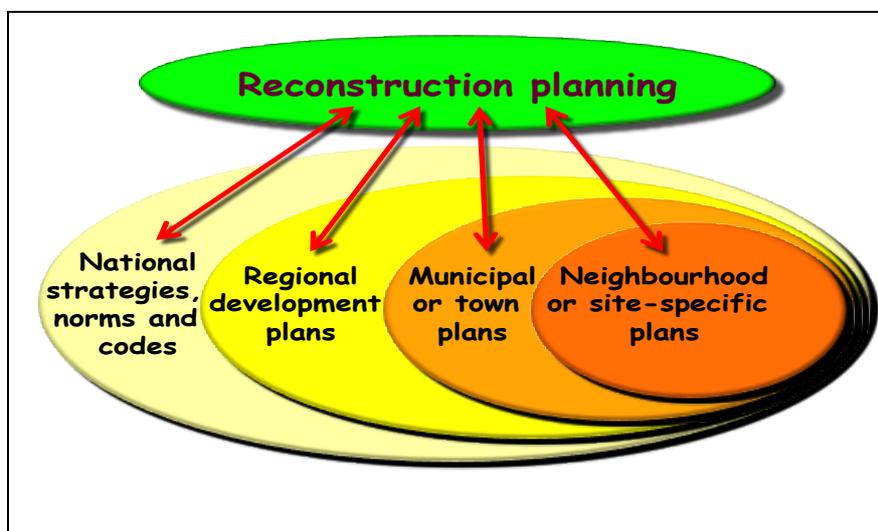


Figure 2.4. Model of Reconstruction planning by David Alexander. Reconstruction planning has to adapt to the specific needs of each governance level take into considerations all the governance levels. Source: David Alexander

Hence, the work of local governments has to be sustained but to allow for flexibility in the implementation of reconstruction plans.

Coordination among sectors and various stakeholders is also necessary. Besides old and new government agencies, the management and performance of reconstruction activities can be also taken on by local and international non-governmental organizations (NGOs), private sector companies and community based organizations (CBOs), media and professional groups (Zhang et al. 2015). Zhang et al. (2015) advocates that a Public-Private-People Partnership (4P) is needed for long-term recovery. In particular community-based groups may provide advocacy and help loosely connected people to come together and gain access to key resources (Olshansky et al. 2006; Storr and Haeffele-Balch 2010). In this sense, CBOs may support a decentralized approach to disaster reconstruction (Storr and Haeffele-Balch 2010). Community-based organizations may have differing structure and assume various roles. Literature of emerging phenomena highlights that four types of organizations are observable during and after disasters: established (old structure and old tasks), expanding (established tasks but changing structure), extending (unvaried structure but new tasks) and emergent (new structure and new tasks) (Lanzara 1983; Quarantelli 1985).

Emergent groups are often more visible in the disaster response phase, and complete their role (i.e. helping clearing debris, disseminate first-hand information to rescuers etc.) after that the immediate relief operations are completed. Thus studies of emergent groups have mostly focussed on the response stage of the disaster life-cycle. However, academic literature has also shown that their tasks and roles can linger into the reconstruction phase as well and lay the groundwork for the activities of recovery organisations (Stallings and Quarantelli 1985; Quarantelli 1985; Wenger and Prater 2013; Tagliacozzo and Arcidiacono, 2016). The case studies presented in this thesis further confirm the pivotal role played by emergent groups, whether or not they are based on social media , in taking ownership over recovery efforts and planning. Some of these groups and organisations are oriented to specific goals, while others have general aims (Stallings and Quarantelli 1985). These groups share characteristics, such as small size, a loose structure and hierarchy and possible lack of

clear leadership. Opposed to the organizations that emerge during disaster response (whose existence is usually ephemeral), organizations that emerge during disaster reconstruction tend to have longer lives and can directly influence other organizations' actions and policies (Quarantelli 1985). The emergence of these organizations is driven by a shared perception that a compelling need is being ignored or not adequately addressed by those bodies that should deal with it, usually government agencies (Lanzara 1983; Stallings and Quarantelli 1985). As a result, the relationship between emergent organizations and government agencies is often hostile for both parties (Lanzara 1983; Stallings and Quarantelli 1985). However, this does not have to be the case, as the benefits of collaboration should outweigh the reasons for conflict (Stallings and Quarantelli 1985). Given that these organizations are often present at the neighbourhood level, and that they reflect local needs, their inclusion in the post-disaster decision-making can empower the affected population (Pyles 2007).

As private companies and businesses provide resources, material and trained personnel for the physical reconstruction and for the economic, environmental and cultural revitalization of the affected area (Smith and Birkland 2012), setting up enduring partnerships between the public and private sector is also crucial to effective reconstruction. An example of efficient and effective public-private alliance in long-term recovery is given by SCIRT (Stronger Christchurch Infrastructure Rebuilding Team), an organization created after the Canterbury earthquakes in New Zealand to oversee the rebuilding of the regional infrastructure that was severely damaged by the earthquakes. SCIRT is led by CERA, Christchurch City Council and the New Zealand Transport Agency, which work alongside private companies that have been chosen to carry out repair works in Christchurch and the surrounding areas.

2.1.3. Key issues in recovery and reconstruction processes

Reconstruction processes pose specific challenges that need to be recognised and deliberately worked out. The multi-sector and multi-tier

approach described in the above section and shown in figures 2.1 and 2.2 of this chapter explains why coordination is one of the greatest issues. Co-operation among and within organisations can be difficult for various reasons, including different organisational structures and cultures, usage of different terminology, unwillingness to decentralise power, and different goals and tasks. In reconstruction contexts, many of the barriers to cooperation can be augmented due to time constraints and to public pressure. Not only recovery agencies have to face the huge effort of rebuilding societal activities and sectors in a relatively short period of time (Olshansky et al. 2012) but they do it under the extreme pressures of impacted people that push to quickly resume their lives (Ingram et al. 2006; Olshansky et al. 2006; Johnson 2014). One possible result is that recovery agencies try to rebuild as quickly as possible and to return to pre-disaster levels without exploiting the window of opportunity to reduce risk offered by the recovery process (Davis 2007). As mentioned above, good reconstruction governance requires that the short-term requirement to make the system functional again is reconciled with the long-term goals of rebuilding sustainably and making the system less vulnerable (Stehr 2001; Ingram et al. 2006; Johnson 2014). In order to enforce new policies, set up new offices and roles and put into place participatory processes, recovery agencies have to be allowed long timings (Davis and Alexander 2016; Platt and So 2016).

Additional challenges are posed by competition between organisations or within recovery agencies over who should take decisions and lead recovery tasks. Although a lead agency is necessary, this should not translate into the exclusion of other levels of government or sectors of society from decision-making. On the contrary, a decentralised recovery management strategy is able to accommodate policies to each level's and sector's needs and demands (Davis and Alexander 2016). Evidence and lessons from previous reconstruction processes suggest that this rule is not always followed. Indeed, in some cases, such as the Canterbury earthquakes and Indian Ocean tsunami recovery, open conflicts have emerged between local and national power levels. At the national level

lead agencies thrust aside local governments or minimised their decision-making power, claiming that they lacked the capacity to handle recovery tasks (Cho 2014; Johnson and Mamula-Seadon 2014).

Decentralization does not necessarily guarantee equal engagement. Research has demonstrated that even an owner-driven approach tends to favour home and land owners, excluding poor people and hence increasing marginalization and social vulnerability (Schilderman and Lyons 2011). Lyons (2009) suggested that the tension between centralized and decentralized approaches to disaster reconstruction may be overcome by the “identification—and maximization—of areas of decision-making which can be decentralized without compromising the general good.” This means that the decentralization does not have to encompass all the areas of rebuilding and may be realized within a central strategic framework.

Recovery agencies have to cope with the complexity and uncertainty of reconstruction projects (Ismail et al. 2014). Time constraints engender a chronic shortage of resources in the reconstruction, both in terms of funding available and of skilled personnel to employ in repair works and reconstruction paperwork (Chang et al. 2012; Ismail et al. 2014). Repairs works may be of poor quality and be executed with delays and by low-skilled personnel. Difficulty in preliminary damage assessment and in managing land issues may add confusion to the post-disaster environment (Ismail et al. 2014). Pre-disaster recovery planning and effective resource management can help prevent delays in reconstruction projects (Ismail et al., 2014). However, corruption is always an inherent threat to disaster reconstruction. According to Alexander (2012) disaster may open Pandora’s box, which exacerbates problems such as corruption, social inequity and political conflicts, which before disaster struck lay hidden under the surface of society. Mechanisms to guarantee monitoring and accountability have therefore to be put in place during disaster reconstruction. These should include two-way communication practices between all the parties involved, but especially with the public, which can help ensure transparency in the allocation of funds and management of the reconstruction projects, which is, in turn, capable of enhancing citizens’

trust and engagement (Asian Development Bank 2015).

2.1.4. Community engagement in disaster reconstruction

Published work and reports of field experiences agree that community engagement is a core component of a successful reconstruction process (Davidson et al. 2007; GFDRR 2015). Citizens' participation in decision making after disasters was found beneficial for various reasons, including increased satisfaction with recovery agencies (Kweit and Kweit 2004), establishment of shared and supported recovery vision and goals (Olshansky 2005), facilitated resettlement (Oliver-Smith 1991) and community empowerment (Davidson et al. 2007). However, the beneficiaries and procedures of involvement remain less clear. Some authors have highlighted that community-based and emergent organisations play a primary role during the reconstruction period (Olshansky 2005, Pyles 2007). Therefore, the involvement of these actors may have empowering effects upon the whole population. However, it has been noted that ethnic minorities and marginalized groups are rarely represented in emergent organizations (Quarantelli 1985), although, in some cases, emergent groups can be created deliberately to assist marginalised groups. Similarly, others have supported owner-driven approaches to reconstruction as opposed to donor-driven ones (Cernea 1997; Barenstein 2008; Lyons 2009). A different perspective argues that owner-driven approaches repeat and exacerbate inequalities by excluding people at the bottom of the social ladder (Schilderman and Lyons 2011).

One of the challenges that advocates of community involvement have to face is the definition of community itself. Current definitions rarely account for the fact that reconstruction processes are embedded within social and political systems that reflect and strive to preserve existing power relationships (Cannon 2008). As pointed out by Tierney and Oliver-Smith (2012 p.134) *"because all systems of provision reflect the interests of powerful social and economic actors, such systems privilege some sectors of society over others. The same is the case for systems that provide for the recovery needs of disaster victims"*. As a result, some actors are

normally facilitated in the access to the systems of assistance during reconstruction while others lag behind (Springgate et al. 2009). These disparities mirror pre-existing inequalities in the social structure and thus reinforce them further. Indeed, the problem of obtaining a really inclusive approach to reconstruction is a difficult one. Recent disaster research has called for the adoption of a broader perspective and the inclusion of groups that are traditionally ignored by research and policies, such as people with disabilities (Quarantelli 1999). However, clear directions and procedures for this goal to be achieved are largely missing.

Many authors (Davidson et al. 2007; Lizarralde and Massyn 2008) warn about considering community participation as a panacea for every reconstruction process and invite readers to evaluate the possible negative consequences of user participation. Indeed, community participation may take on a number of forms and it is not possible to propose a single theoretical model for it. As outlined by Davidson et al. (2007), "*There is obviously no single 'best' approach for user participation, since construction in general and reconstruction in particular are rooted in their socio-politico-economic contexts*". In a similar vein, Vallance (2011) noted that much of the literature on community involvement assumes that recovery agencies are willing and able to listen to citizens' inputs and that communities are willing and able to participate. Similar propositions perpetuate the mistake of considering reconstruction processes as occurring in a vacuum. On the other hand, disasters make more evident and accelerate local and global trends, which should therefore be acknowledged when analysing reconstruction processes. Social and political pressures to return to pre-disaster levels can also hamper participatory processes, which, by definition, take time (Sadiqi et al. 2011). Levels of community involvement may also vary. Arnstein (1969) developed a "ladder of citizen participation" in decision-making. At the bottom of the ladder, citizens may be merely consulted or informed about planning activities, whereas at the top of the ladder, citizens are actively engaged in these activities and may have partial control over them. Research (Davidson et al. 2007; Vallance 2011) has demonstrated that the

involvement of local communities in the recovery often remains at a mere consultative or informative level and local needs are often not included in post-disaster plans.

Despite these challenges, some suggestions have been made. For example, two-way communication practices aimed at building dialogue among the parties have proven crucial to single out specific groups' information needs. Development of functional and inclusive communication and feedback mechanisms paves the way for community engagement. Civil society organizations and groups of professionals may be crucial mediators of the communication that occurs between institutions and citizens (Ozden 2006). For these mechanisms to be successful, trusting relationships should be established and nurtured before disaster occurs (Ophiyaandri et al. 2010; Vallance 2011). Oulahen and Doberstein (2010) evaluated community participation in floods risk reduction plans in Peterborough, Ontario, on the basis of the framework developed by Brody et al. (2003). The authors concluded that a plan for citizen participation should be developed in the very early stages of the planning process. In turn, the planning process should include a wide variety of participation techniques, a clear statement of the level of engagement and of the goals to be achieved and both social and geographical coverage of the participatory initiatives.

In the following sections, I will elaborate on the dynamics of the communication practices before, during and after disasters and the developments brought about by Web 2.0 technologies. Communication practices and participation are two interrelated concepts. As described by Opdyke et al. (2016, p.3), "*Stakeholder participation is fundamentally governed by communication between actors. Communicative acts create the social reality that surrounds decisions, actions and allocation of resources. Communication is also the field through which participation is contested and negotiation occurs*". Good communication practices pave the way for meaningful engagement during post-disaster reconstruction.

2.2. Communicating before, during and after disasters

In disaster management understanding communication processes is crucial (Quarantelli 1986). Gilbert (1998) advocated that one way of viewing disaster is as a failure of communication within a community, namely in receiving information and informing other people. Auf der Heide (1989) observed that “one of the most consistent observations about disasters is that communication is inadequate”. However, until the 1960s the theme of communication was largely absent from the emergency management literature (Quarantelli 1987). Thanks to the advancements in both disaster research and media technology, research on the role of mass media systems during crises and disasters proliferated in the 1970s (e.g. Hannigan 1976; Scanlon et al. 1978; Krieghbaum 1979) and 1980s (e.g. Kreps 1980, Alexander 1980; Wenger 1985; Adams 1986). These studies reflected the view that disasters are primarily a socially constructed event (Tierney 2007), and mass media operate within a social environment (Quarantelli 1991) that influences which events receive more coverage and are publicly represented as a disaster (Adams 1986). In 1978 the US National Academy of Sciences established a committee to review the state of art of the role of mass media in disasters that, in 1980, resulted in publication of the influential report “Mass Media and Disasters” (Committee on Disasters and the Mass Media 1980)

Quarantelli (1991) noted that the mass media played a huge role in passing on warning information and reporting disaster news. However, communication regarding disaster preparedness and mitigation activities was largely absent (Quarantelli 1991). In recent decades, research on communication in disaster has flourished, and has focussed particularly on risk communication (e.g. Keeney and von Winterfeldt 1986; Johnson and Slovic 1994; Blanchard-Boehm 1998), warning messages (Anderson 1969; Mileti and Sorensen 1990; Mileti and O’Brien 1992) and crisis communication (Seeger 2006; Spence et al. 2007a). Studies of communication during crises have focussed on the organisational perspective (Benoit 1997; Taylor and Perry 2005; Coombs 2007), as well

as on information-seeking and sharing behaviours by the affected population (Spence et al. 2007a; Spence et al. 2007b). Indeed, in order to make sense of the chaotic situation, people intensify information-seeking behaviours during disasters (Tierney 2009).

Research has tended to approach risk communication and crisis communication as separate issues. While the former was intended to inform the public about potential hazards and persuade people to adopt preparedness measures, the latter was traditionally associated with public relations activities. It aimed to minimise harm to organisations and stakeholders (Reynolds and Seeger, 2005). Recent developments have called for more integrated models in which communication extends from before to during and after crisis. The reason for this is that risk and crisis communication share some goals and are profoundly interrelated (Lachlan et al. 2016). For example, they are both intended to mitigate harm during an event and to reduce uncertainty (Lachlan et al. 2016). The crisis and emergency risk communication (CERC) model of Reynolds and Seeger (2005) posited that crisis communication should develop throughout the five stages of a crisis (pre-crisis, initial event, maintenance, resolution and evaluation), although specific communication strategies and goals must be adopted in each of these stages.

Communication models of emergency management have largely been influenced by different conceptualisations of crisis. Crisis models like the ones proposed by Fink (1986), Mitroff (1994) and Coombs (1999) differ in terms of number of crises stages and activities although some functions described are similar in all the models and can overlap. Coombs's situational crisis communication theory (SCCT) took a different perspective (Coombs 2007). Rather than focusing on the crisis stage, this theory builds on attribution theory (Heider 1958; Weiner 1974) and stresses the features that influence public perception of the crisis and the attribution of responsibility for its consequences. The theory is therefore geared towards the development of communication strategies that are able to protect stakeholders' reputations. In a similar vein, image restoration theory (Benoit 1997) saw the maintenance of a positive reputation as a key goal

of communication and described possible strategies that could be adopted to restore organisational and individual reputations in the face of crisis.

Although crisis communication theories and models have been widely used in disaster research (e.g. Sellnow et al. 2002, Spence et al. 2007a), Coombs (2010) warned one not to use the terms “crisis communication” and “disaster communication” in an interchangeable manner. Indeed, disasters cause large-scale damage to human life and physical environment and generate high economic and social costs that must be coped with through complex management procedures maintained over an extended period of time (Shaluf et al. 2003). Conversely, crises require rapid decision-making and unfold often in a shorter timeframe (Shaluf et al. 2003). Disasters result from a combination of hazards and vulnerabilities and are exacerbated by the lack of planning and coordination mechanisms (Alexander 2003). Crises are usually unexpected and uncontrollable situations faced by individuals, groups or organisations, which impede normal operations (Alexander 2005). A disaster demands multiagency coordination, which is not always required in the event of crises. A disaster may require that crisis communication plans are activated by single organisations and agencies to protect their reputations and fulfil the specific information needs of each organisation’s stakeholders and audience (Coombs 2010).

Whatever one deals with risk, crisis or disaster communication, there are some common best practices that can be followed though. For example, working with media outlets is crucial in both disasters and crises and throughout the various stages (Williams and Olaniran 1998; Scanlon 2007). The establishment of plans, procedures and relationships before the disaster or the crisis may help one to coordinate and respond better (Seeger 2006; Chester et al. 2017). The public has to be considered as a partner in risk, crisis and disaster communication rather than mere recipients, although a coordinating body to manage official communications and discussions should be established (Chester et al. 2017). Communication has to be as transparent as possible about potential risks and responsive to the public’s concerns (Veil et al. 2011).

Building trust through two-way information flow is another crucial ingredient of every communication plan (Seeger 2006; Longstaff and Yang 2008; Nicholls et al. 2010). Indeed, research has demonstrated that the elaboration of messages depends on the extent to which the source is trusted (Griffin et al. 2004).

Another way to look at disaster communication is by analysing channels, messages and barriers. Quarantelli (1986) noted that communication issues during disasters concern communication within emergency management organisations, between organisations, between organisations and the public, between the public and emergency agencies and between organisational systems. Multiple stakeholders and multiple-tier coordination are major concerns of disaster communication plans (Coombs 2010). However, communication may also be hampered by different organisational goals and cultures, a lack of clear understanding or definition of roles and responsibilities, time pressures, competition among organisations and technical issues of interoperability between communication systems (Manoi and Baker 2007; Palttala et al. 2012).

Previous research has demonstrated that in order to communicate efficiently and effectively before, during and after disasters a multiple-channel approach has to be adopted (Nicholls 2012; Twigg 2015b). A multichannel approach is intended to respond not only to the diversity of the audience in terms of needs and media preferences but also to the intrinsic tendency of people to look for information from various sources when they face risks or crises (Spence et al. 2007a; Nicholls et al. 2010; Sommerfeldt 2015). Various studies have found television, radio, face-to-face meetings and newspapers to be the preferred means of obtaining information in times of disaster (Wray 2004; Spence et al. 2007a; Austin et al. 2012; Burger et al. 2013; IOM 2014; InterNews 2015; BBC Media Action 2015; Steelman et al. 2015). Cellular telephones and social media proved to be crucial in seeking out and sharing disaster-related information, especially where literacy levels are high and local information is not available from mass media (Sutton et al. 2008; Bunce et al. 2012; Internews 2014).

Lastly, modern disaster communication has moved away from a message-centred approach to a more audience-centred one (Palenchar 2009). This shift has been the result of an increased awareness among disaster researchers that information-seeking patterns and message-processing mechanisms may vary across age, gender, socio-economic status, education, ethnicity and race (Mileti and Sorensen 1990; Spence et al. 2006; Noske-Turner et al. 2014; Sommerfeldt 2015). Effective disaster communication requires that strategies are sensitive to culture (Noske-Turner et al. 2014) and informed by knowledge of the pre-disaster communication landscapes, existing communication conduits (i.e. faith-based organisations) and characteristics of the social groups targeted. By communicating *with* communities, rather than *to* communities, government agencies can determine what information is being sought and can empower people to address their needs on their own and take informed decisions (IFRC 2005; Nicholls 2012). The “communicating with communities” (CwC) paradigm has also recently gained ground among international relief organisations. After Typhoon Yolanda struck the Philippines in November 2013, killing over 6,000 people and causing widespread damage, UNOCHA deployed two new interagency working groups, denominated Communicating with Communities (CwC) and Accountability to the Affected Population (AAP). They had the task of gathering community feedback, and information and communication needs for all the affected population (CDAC network 2014).

2.2.1. Communication by citizens and authorities in disaster reconstruction

According to Nicholls (2012) the role of communication after disasters should be “to contribute to and, where possible, expedite recovery, through a combination of information and dialogue”. Given that new opportunities to spur social change can open up, communicating with communities is of particular relevance during disaster reconstruction. Indeed, whilst disaster response requires rapid gathering and spreading of information with little time for meaningful engagement, long-term communication initiatives can

be developed in a context of lower risk and can convey messages designed to cause social and behavioural change, policy reform, capacity building and the promotion of accountability and feedback mechanisms. More complete formative research can also be undertaken in this context in order to single out vulnerable social groups, identify information and communication needs for each of these, and target actions accordingly (Government of Australia 2014; Tagliacozzo and Magni 2016).

Despite the opportunities offered, very little research has tackled directly communication during post-disaster reconstruction (Nicholls et al. 2010; Nicholls 2012). In the main, reports (World Bank 2010, Government of Australia 2014) have provided general guidelines and best practices for government agencies. According to the Australian Red Cross (2010) a communication needs assessment (CNA) during disaster recovery should include an initial analysis of the broader context, of the resources available and of the community stakeholders, the definition of the objectives and methods of the communication strategy and the implementation of feedback loops and evaluation mechanisms. The World Bank (2010) has proposed a communication-based assessment methodology (CBA) that allows national and international agencies to produce a communication strategy tailored to the needs of different social groups. A CBA has the scope of gathering qualitative contextual information that gives details of the perceptions and expectations of stakeholders and provides information about appropriate communication strategies. Whilst a CBA should ideally be carried out immediately after a disaster, along with other forms of assessment, its outcomes and the communication strategies built upon it, should be continuously reviewed as the population moves from response to early recovery to reconstruction.

General statements have also been issued that stress the centrality of communication as dialogue and also of the establishment of feedback mechanisms (FEMA 2011; World Bank 2010). Building dialogue and trust not only allows recovery authorities to provide information to the public but also enables people to express their needs and have their voices heard in the reconstruction process (Nicholls 2012). Recovery communications

should be sent out in a coordinated and consistent manner and should reach out even to the most marginalised groups. Given the overload of information, the number of actors involved and the distress produced by recovery procedures, the ability of the population to interpret information may be negatively impacted. Therefore, the same recovery message should be repeated using different communication methods, i.e., by convergent communication (Australian Red Cross 2010). At the same time, messages have to adapt to the distinct information needs of different social groups. Therefore the use of various channels can serve to fulfil different communication preferences, in a form of complementary communication.

McNaughton et al. (2015) acknowledged that leadership and communication during disaster reconstruction can be hampered by uncertainty, size and complexity of the needs to be addressed, time pressure and high expectations and distress of the impacted population. Disaster reconstruction leaders should manage these issues by balancing communication about reconstruction challenges and hope about a brighter future (McNaughton et al. 2015). Communicating post-disaster realities to outside agencies and personnel, often composed by non-experts, is another major issue. Building on local social networks and communication conduits may help recovery agencies to overcome many of these challenges (Australian Red Cross 2010).

Despite these general guidelines, there is no body of literature that systematically investigates communication processes by authorities and citizens in long-term reconstruction. It is therefore difficult to say which specific communication and information needs and practices emerge during this period, how they diversify across the social groups and how they evolve over the time.

2.3. Communication in disasters supported by technology: a shift in paradigm

In early work, Quarantelli (1991) noted that the type of media used influenced the way in which the information was conveyed during disasters and the role of the communication itself. This draws on early work by McLuhan et al. (1967), which stress the centrality of studying the medium that carries the message rather than merely its content. Building on a paradigm of technological determinism, McLuhan et al. advocated that the technologies and instruments available within a society shape the social context and the interactions between its components. In relation to disaster communication, Quarantelli (1991) noted a difference between print and electronic media (represented by radio and television) in that the latter were more likely directly to present citizens' accounts during disasters and make use of the affected citizens as a source of information. In doing so, they diminished the ability of gatekeepers to handle and edit information. Additionally, he suggested that, by giving voice to the citizens' stories and personal accounts, electronic media, particularly radios, served as interpersonal media and facilitated the exchange of information between people. These two features, diminished role of information gatekeepers and focus on interpersonal communication, are central to understand the shift from a one-way communication model (from the sender to the recipient of information) to the multiple communications that characterise modern disaster response and management mediated by social media. In the reports mentioned above, Quarantelli envisaged the disruptive role of the new interactive technologies on disaster communication (Quarantelli 1987, 1991). In a later study (Quarantelli 1997), he described the positive aspects as well as the challenges that these on-line interactive technologies have brought, including overload of information, spreading of rumours, difficult coordination, the digital divide and communication system failures. However he could hardly envisage the ubiquitous presence that they have nowadays in daily communication, as well as during crises and disasters.

There is a general consensus among researchers that interactive technology, especially social media, have profoundly changed the way in which disaster communication is occurring. These changes are of both a quantitative and a qualitative nature (Quarantelli 1999). On the quantitative side, social media technology provides a platform that makes well-known communication processes and dynamics more visible and broadens them as they unfold before, during and after disastrous events (Palen et al. 2010). For example, it facilitates dissemination of preparedness-related information (Briones et al. 2011), information seeking and sharing behaviours (Palen and Liu 2007; Twigg 2015b), convergence of material and mobilisation of volunteers toward the impacted zone as well as the gathering and re-distribution of disaster-related information across a wide network of actors not necessarily located in the disaster area (Hughes et al. 2008; White et al. 2014). In the long-term, social media technology aids the creation of citizens groups formed to manage long-term recovery efforts (Farinosi and Trerè 2010, 2016).

On the qualitative side, interactive technology has modified socially constructed power and knowledge production structures. Far from affecting only the emergency management discipline, these changes have touched many different domains, such as science, geography, journalism and governance. This weakens the idea that knowledge is created and distributed only by experts or decision makers. With this technology, the boundaries between the producers and users of the knowledge blur. Ordinary people engage in knowledge-creation activities, disseminate knowledge and information across a distribute network, and make use of the knowledge created by others. In so doing, they become part of a collective intelligence that builds knowledge through continuous interactions, without the mediation of information-keepers such as scientists, experts of various kinds, policy makers and decision makers (Mythen 2010). In this new communication context, government agencies and experts have been forced to take to social media in order to manage the expectations of responsiveness held by their audiences (Mergel 2015).

Returning to the disaster management field, the advent of new

communication technologies has called for the complete abandonment of the view of people affected by disasters as mere passive recipients of aid. Emergency managers and government officers have soon realized the ability of the information provided by the public to fill the informational gaps which hamper or slow down emergency response (Yates and Pasquette 2011; HHI 2011; Virtual Social Media Working Group & DHS First respondents Group 2012, 2013). Indeed ordinary citizens are the first respondents in case of a disaster and have a real-time insight into the needs to be addressed urgently. Crowdsourced data have challenged the traditional command and control approach over information flow and have forced emergency organizations to adapt their working environment and modes to the new communication landscape. However, in the uptake of such technologies these organizations have lagged behind (Tapia et al. 2011). Their introduction in emergency management agencies has often been in the hands of social media champions (Latonero and Shklovski 2011). Academic and governmental studies and reports have documented the challenges that formal agencies are facing to integrate social media technologies fully into their official communication channels during emergencies especially when it comes to the development of two-way communication with citizens (Giroux et al. 2013; Low et al. 2010; Hiltz et al. 2014). Some of the challenges include the following: overload of information and difficulty in selecting data to take informed decisions upon during emergencies; problems in distinguishing accurate and relevant information from rumours; lack of guidelines and company policies; lack of trained staff to monitor constantly social media platforms; and potential legal liabilities of governmental officers.

In recent years, researchers have been working on solving some of these issues and have proposed systems for big data analysis (Hiltz and Plotnick 2013) and the identification of rumour (Mendoza et al. 2010). New organizations and teams have been created with the goal of supporting monitoring and analysis of the information posted on social media platforms during disasters (e.g. Humanity Road, Crisis Mappers, VOST, Palantir, Crisis Commons, Standby Taskforce).

Some example of the uptake and use of social media by emergency and government agencies are worth mentioning. Along with constantly engaging with the public on different social media channels by providing information on how to prepare for and respond to disasters, the US Federal Emergency Management Agency (FEMA) has launched an app to crowdsource photographs during disasters (Adamski 2013). In the Philippines, several government agencies used social media to send out information to the public during Typhoon Yolanda. They promoted the use of crisis hashtags to send information and requests for help (Meier 2014)

Studies have also demonstrated that new media play a crucial role in disseminating information used for early hazard detection. In this respect, ordinary citizens can act as human sensors (Laituri and Kodrich 2008) and can help monitor outbreaks of disease (Brownstein et al. 2009) or detect the first signals of an imminent disaster, thus fulfilling a role of early surveillance and warning.

Studies of the use of social media in disaster recovery remain scarce and tend to focus on early recovery, defined as a transition period between relief operations and medium-term recovery that encompasses the restoration of basic services, livelihoods, shelter and governance (UNDP 2008, p. 7). In this period, crowdsourced information retrieved on social media combined with remote satellite imagery may help immediate damage assessment (Liang et al. 2013), early reconnaissance (Dashti et al., 2014) and support coordination of volunteers and fundraising activities (Houston et al. 2015). There is much anecdotal evidence but few academic studies showing that social media may also provide an overview of the resources available to long-term recovery. Those that there are (Shklovski et al. 2010; Lev-on 2010; Farinosi 2011; Semaan and Mark 2011, 2012; Tagliacozzo and Arcidiacono 2015, 2016; Houston et al. 2015; Tagliacozzo and Magni 2016) show that social media are employed by the affected population to discuss reconstruction issues and responsibilities in the longer term, provide and receive recovery information, memorialise victims and maintain social relationships that help to overcome the problems caused by disruption of physical infrastructure.

*2.3.1. Communication in disasters via digital media: challenges
and opportunities for the coproduction of disaster communications*

The advent and rapid advancement of new communication technology have highlighted the dialogue-making, transactional and complex nature of disaster communication. Despite this, evidence shows that emergency managers fail to acknowledge the factors which influence the broadcast, reception and elaboration of disaster messages. They still assume that communication is a linear process that occurs from a sender to a receiver (Pechta et al. 2010). In addition, tensions about who keeps ownership and control over information flow and management often emerge during disasters. For example, during the Christchurch earthquake response, emergency managers and government agencies failed to integrate their emergency communications with the information collected and distributed by volunteers and emergent groups (Bourk and Holland 2014). This failure resulted in duplication of information, which added confusion to the chaotic disaster response context. Recently developed models develop the vision of the public as participant and partner in the co-production of disaster communication (Palen et al. 2010; Pechta et al. 2010; Bourk and Holland 2014).

As I explained in the precedent section, this vision has risen to prominence particularly thanks to new communication technologies that enable people to share information and knowledge in on-line public spaces. Public-to-public and public-to-government communications travel in these on-line spaces and cannot be overlooked in emergency management plans without risking reduction in the effectiveness of response and management capability. Disaster response and management has increasingly become socially distributed (Palen et al. 2010). Failure to acknowledge these emergent phenomena means falling short in mitigating, responding to and recovering from disasters. The idea of co-production and co-management of disaster communication has gained ground alongside the rise of

community-based approaches to disaster risk reduction and climate change.

In disaster contexts, co-production of public information services from government agencies and citizens proved to be successful in enhancing capacity to respond. For example, Chatfield et al. (2014) noted that the official information outreach during Hurricane Sandy in the USA was greatly increased by the cooperation of citizens who propagated it on-line to their wider networks. Similarly, Chatfield and Brajawidagda (2014) demonstrated that hazardous weather reports produced by citizens via the Twitter sphere before the landfall of an EF 5 intensity tornado in Oklahoma in 2013 complemented the government's warning-related information and augmented response capacity. Traditional knowledge hierarchies may also be toppled by groups of volunteers that emerge in the aftermath of disasters and propose different perspectives on social–ecological relationships (Goldstein 2008).

Despite the evidence of these benefits, enthusiasts fall short in acknowledging the problems that may arise during each stage of the communication co-production process. As remarked by Goldstein (2008) *“co-production calls attention to the social dimensions of cognitive commitments and understandings, while at the same time underscoring the epistemic and material correlates of institutions”*. Coproduction of disaster communications has to deal with differences in power relationships, normative contexts, systems of thoughts and world views. Information coproduction is a highly contextual social process (McNie 2013), which requires many resources and great time-management capability. Despite the differences in information management and production systems, information from several actors has to be extracted, combined and turned into actionable knowledge (Von Lubitz et al. 2008). Moreover, uncertainty that normally accompanies crisis and disastrous events may heighten some of these challenges, making it more difficult to reach a shared ground for the co-production of information.

2.4. Gaps in research

According to Tierney and Oliver-Smith (2012, p.123), theory development in disaster reconstruction “*has been hampered by the lack of a systematic comparative focus and a failure to contextualize recovery within broader global and societal conditions and trends*”. The dearth of comparative and longitudinal studies, coupled with an overly attention to recovery of the physical and economic dimensions, has left many areas of disaster reconstruction understudied. For example, despite many references to the importance of communication practices during PDR, current knowledge is scattered and non-systematic and can hardly be used to make a prediction or plan. Furthermore, few studies have been conducted into how new communication technology can be exploited in a manner that enhances government-to-citizen and citizen-to-government communication and promotes social change and knowledge co-production. The same could be said for the stream of literature that tackles communication and social media use in disastrous events, which has proceeded to build knowledge one case study at the time (Bruns and Stieglitz 2012). Recent research has pushed toward the identification of general communication patterns through cross-case comparison (Waters and Williams 2011; Bruns and Stieglitz 2012; Burgess and Bruns 2013). In addition, literature on disaster communication often falls short of adopting a theory-driven approach to inform research and integrate findings into existing communication theories (Risk and Disaster Communication Centre 2014). The only way to avoid repetition and duplication of effort is a cross-disciplinary approach, which acknowledges and knits together the fragmented knowledge produced on disaster communication across disciplines (Risk and Disaster Communication Centre 2014). As well as consolidated research and theories, studies of disaster reconstruction and communication should also be informed by a full understanding of the social, cultural and historical frames of reference.

This dissertation is an attempt to address some of these gaps in research. It does so by drawing from various literature streams and disciplines,

including disaster communication, disaster reconstruction, and social media use in government and for community engagement. Knowledge is derived from descriptive case studies but cross-case comparison is performed in order to identify generalizable lessons. For each case study, an in-depth analysis of the social and political contexts previously existing or newly generated by the disaster is presented. In Chapter 6, general lessons identified through the comparison of the two case studies are compared with established communication theories on computer-mediated communication and information seeking (see Chapter 3 for a short review of these theories). The ultimate goal is the advancement of knowledge and the construction of a framework for communication and social media usage in the context of post-disaster reconstruction. The next chapter will outline the epistemology and methodological approach adopted in order to perform this research.

CHAPTER 3

RESEARCH PARADIGM, DESIGN AND METHODOLOGY

3.1. Research goals and questions

Drawing from the gaps in research identified at the end of the previous chapter, the goal of this dissertation is the *investigation of communication practices and social media usage by government agencies and citizens during the post-disaster reconstruction (PDR) phase*. To this end, a need is recognized to fill the gaps in and to provide original contribution to existing knowledge, especially in terms of:

- dynamics of communication that occurs in the reconstruction context
- current motivations, barriers and attitudes toward the use of social media regarding communication during disaster reconstruction.

More specifically, this research aims to answer the following questions:

1. What communication practices (e.g. content of the message, actors involved and channels of communication) are put in place by government agencies and citizens during a reconstruction process?
2. What is the role of the social media in the communications that takes place during this period?
3. What are the attitudes, motivations and barriers to use of social media in the long-term period after a disaster?

Answering these research questions requires a deep understanding of the characteristics and key issues of the reconstruction context and the identification of regularities and patterns that can be extended and generalized to other settings throughout the world. The challenge here is to

dig into a specific context to derive knowledge about an unexplored research area while also trying to figure out what knowledge is setting-specific and what could be applied elsewhere.

3.2. Research epistemology, ontology and design

3.2.1. *Research epistemology and ontology*

After having defined research goals and questions and before proceeding with the definition of the methodology to collect data, it is crucial to outline the epistemology and ontology of this research and thus to clarify the underlying assumptions about what constitutes knowledge and how it can be derived. These assumptions will determine the appropriateness of the data collection methods and data analysis and hence the validity of the results.

This research follows a *naturalistic approach* (Lincoln and Guba 1985), also known as constructivism (Lincoln and Guba 2000). Naturalistic enquiry has been defined as a “research that focuses on how people behave when absorbed in genuine life experiences in natural settings” (Frey et al. 1999). As such, it considers that multiple realities are constructed and that reality can be understood only in the natural setting in which it occurs. Knowledge is derived inductively through the interactions between the researcher and the research context rather than through methodologies that allow one to test out pre-defined hypotheses. In a naturalistic inquiry, the researcher immerses himself in the research context, trying to get the different perspectives of the actors and analysing the phenomenon in context by using multiple methodological procedures as well as his feelings and intuitions (tacit knowledge). Opposed to positivistic paradigms, constructivism does not consider a priori theory as able adequately to explain and account for the complexity of the context and of the realities constructed by its actors. Rather, meanings are allowed to emerge from the research process.

The naturalistic approach has been widely used in both communication (Frey et al. 1999) and disaster research (e.g. Loosemore 1999; DeLorme et al. 2004). If we consider communication research as the investigation of “people who exchange messages through channels within a particular context”, it becomes evident that the social and technical context influences the way in which people interact and communicate (Frey et al. 1999). Disaster research may also benefit greatly from a naturalistic approach, as it allows for a more flexible design and adapts better to the dynamism of the disaster context (Phillips 2014).

The rationale for using a naturalistic approach in this research stems from the following considerations:-

- Reconstruction settings carry specific features that need to be understood by digging into and analysing the context. The complexity and multitude of intertwined actors, events and problems can only be investigated if the context is considered.
- From this, it follows that existing theories and knowledge on communication in general, and crisis communication in particular, may not be applicable in reconstruction settings. Therefore it is necessary to construct knowledge through in-depth analysis of communication within a reconstruction setting.--
- Communication dynamics and the adoption of communication technology can only be understood in the context in which they occur and evolve.

3.2.2. Research design: case study and comparative approach

Building on a naturalistic approach, this research makes use of *descriptive case study design* to provide an in-depth description of the dynamics of communication and of social media consumption that unfold during disaster reconstruction. Specific attention is paid to contextual and cultural factors that influence these practices. In this respect, the research is also informed by a communication ecology perspective (Altheide 1994), in that it takes into consideration the context in which the communicative

processes occur, including the social and power relationships, cultural aspects, the nature of communication and other media already in use. As explained in the introduction and in this chapter, the use of a theory-building approach by the inductive analysis of field data means that no specific hypotheses are formulated to guide the search for results. However previous knowledge guides data collection and analysis. Descriptive case study design (Yin 1984, 2009) enables an in-depth analysis of real-life scenarios. Disaster research has widely used case studies (e.g. Enarson and Morrow 1998; Ganapati and Ganapati 2009) to investigate the complex dynamics and interrelationships operating before, during and after a disaster. Indeed this methodology “focuses on understanding the dynamics present within single contexts” (Eisenhardt 1989, p. 534) and allows to “retain the holistic and meaningful characteristics of real-life events” (Yin 1984, p.2). Among criteria for using a case study approach, the topic investigated should be a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin 1984 as in Schell 1992).

Naturalistic enquiry permits the identification of unique context-specific dynamics (Guba and Lincoln 1982). However, the need to identify generalizable patterns was acknowledged in order to build a framework of communications and social media usage during post-disaster reconstruction. To this end, a multiple case study design was embraced. Yin (1984) denominated multiple case study design as the use of two or more case studies to confirm emerging constructs or discover complementary aspects of a phenomenon (Santos and Eisenhardt 2004). Multiple case study design adopts replication logic to generate theories that are robust and generalizable (Santos and Eisenhardt 2004). Cases are selected in such a way as to replicate or extend previous findings (theoretical sampling). Both qualitative and quantitative data are used. The distinctive feature of multiple case study design is that each case study is treated as a separate instance and forms the basis for replication (Santos and Eisenhardt 2004). The goal of replication is to allow analytical

generalisation, namely to generalise results to theoretical propositions rather than to a given population (Yin 2003). The final step of generalisation is the interpretation of the emergent frame against established literature (Santos and Eisenhardt 2004).

Drawing from these considerations, two case studies were used for analysis. The comparison of the results obtained has enabled me to identify commonalities and sketch out an emergent framework of post-disaster communications and social media usage. This research adopts an explicitly case-oriented strategy for cross-cases comparison (Ragin 1987). As explained by Lor (2011, p.14), "What this implies is that the case is of interest in itself and not merely a bearer of a set of variables, and that relationships within a case are of at least as much interest as the generalized relationships among variables across cases". In opposition to a variable-oriented approach, case-oriented strategy offers in-depth analysis of a relatively small number of studies that are considered as a whole entity that is able to provide a rich understanding of certain facts (Ragin 1999). In case-oriented strategy, replication and not statistical measures determines generalizability.

In order to create this emergent frame, a theory building approach was deliberately adopted and the procedure suggested by Eisenhardt was followed. Eisenhardt (1989) described a method that allows one to build theories from case-study research, which includes: (a) definition of general research questions; (b) selection of cases; (c) use of different data collection methods; (d) entering and analyzing the field (by using field notes and overlapping data analysis with data collection); (e) conducting within-case analysis (considering each case as a stand alone entity); (f) searching for cross-case patterns; (g) comparing the emergent frame with case data; and (h) comparing the emergent concepts with the existing literature. As such, after having established general research questions and performed a literature review of exiting statistics and scientific research on the topic, each case study has undergone an in-depth analysis through multiple data collection methods. Once the within-case

data analysis was completed, cross-case patterns were researched and the emerging frame was compared with the data collected and with scientific research and theories (see Chapter 6 of this dissertation).

Notably, for each case study, three level of analysis were considered: the communication system level (related to actors, media and content of the communication), the contextual level (the context is which the communication process takes place and it is embedded) and the cultural level (the set of norms and beliefs that exists in a specific context).

At the systemic level, the elements that constitute the communication process were analysed, as suggested by Lasswell’s model (1948) (figure 3.1). In particular an attempt was made to sketch out the characteristics of the communicator and of the receiver, as well as to identify message, medium and effect of the communication.

Lasswell’s Communication Model

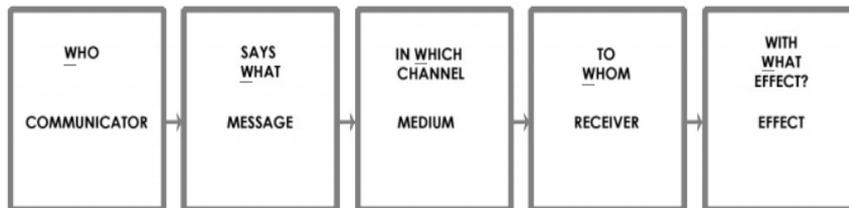


Figure 3.1. Lasswell’s communication model (1948)

In other words, I offer an insight into the actors of the post-disaster communication landscape regarding which channels were used to convey which type of information. This is an innovative approach, as most of the reports addressing post-disaster communication offer only general guidelines on how the communication should work rather than trying to understand the dynamics and characteristics of communication.

Building on a 'communication ecology' approach, contextual factors that affect communication practices are especially highlighted. During disaster reconstruction, these practices may be influenced by pre-existing communication dynamics and social and power relationships, as well as by ones that are newly created by the disaster (e.g. new social problems that may rise or new institutions that are set up). In this research, the contextual level of post-disaster communication was analysed by gathering data, for each case study, on pre-existing communication dynamics that operated in the country and in the specific context. Data were also gathered on events (e.g. turning points and issues) and actors (e.g. key stakeholders and communication conduits) in the reconstruction process. For each case study, positives and negatives were highlighted. Positives could include public engagement activities and use of new technologies to provide recovery information. Negatives could refer to the specific challenges encountered by residents and authorities and lack of communication between the two. The analysis of contextual factors is at the basis of communication-based assessment (CBA) and communication needs assessment (CNA), which enable one to build effective communication strategies in post-disaster scenarios (World Bank 2010).

The last level of cultural factors that influence communication was analysed through a comparison of the data from the two reconstruction processes that occurred in different socio-cultural contexts. In doing so, I used an etic-emic approach, which looked into the cross-cultural regularities while also appreciating the uniqueness of the behaviours and attitudes within each culture (Davidson et al. 1976; Franklin 1996; Mead Niblo and Jackson 2004).

3.2.3. Choice of the case studies: comparability and differences

Two areas recently affected by a disaster were examined: Emilia-Romagna, northern Italy (earthquakes of 20 and 29 May 2012); and Christchurch, New Zealand (earthquakes of 4 September 2010 and 22 February 2011).

The characteristics and key events of the reconstruction processes that followed these disasters will be described in detail in Chapters 4 and 5. These disasters were chosen on the basis of several considerations, including my ability to speak the local language, the level of freedom of expressions in the country (which may influence the chances of using digital technology to express opinions and discuss with government agencies) and the comparability of the disaster's impact. In particular, the ability to speak the local language was considered an essential element to enter the field and collect data that could be presented in various formats including, for example, posters affixed in the street. The choice of the case studies followed a most similar system design (Przeworski and Teune 1970). Indeed the two case studies were considered *quite similar*, especially in terms of the following elements: (a) the recovery process was still underway; (b) the use of new media was free and widespread in both countries; (c) new media had proven to have a crucial role in the response and recovery phase of both these disasters; (d) a severe aftershock followed the first event; (e) both these areas were important to the country's economy when the earthquake struck; and (f) a large number of civil society organizations and groups born after these disasters took the lead in the reconstruction process.

However, other factors differ between the two case studies and should be taken into consideration during the process of comparison. For example, for the Emilia- Romagna case study the type of areas affected consisted of a set of small towns whereas in New Zealand it was a big city to be stricken. Differences in cultural and historical trends represent other variables to account for. Also the management of the recovery process and the key decisions taken after the initial emergency period had an impact in the long run. All these variables are predicted to act upon communication practices and social media usage.

3.3. Theoretical frameworks for in-case and cross-case analysis

This section looks at existing theories and literature concerning

communication and social behaviour that may help to understand dynamics and patterns of post-disaster communication. Although there is a need to acknowledge that PDR contexts may present peculiarities compared to routine contexts, it may be the case that some communication dynamics studied in non-crisis situations hold true for post-disaster communication. Chapter 6 of this dissertation will summarise cross-case patterns and, whenever possible, will try to explain them in the light of existing communication and media theories and knowledge.

As mentioned before, for each case study, three different levels were considered in the analysis: the communication system level, the contextual level and the cultural level. Previous research and established theories demonstrate that all these elements are crucial if we are to analyse communication practices successfully.

The relevance of understanding the constitutive elements of the communication practices is shown by several theories that highlight how practices may change according to individual characteristics and the assessment of the effects of the medium of communication adopted (Davis 1989; Dimitrova and Chen 2006). For example, socio-demographic factors (gender, age, level of income, level of education, social class and ethnic group, disability) proved to be relevant to an assessment of the propensity to adopt new technology and the motivations of media consumption (Thayer and Ray 2006; Dunaetz et al. 2015). In addition to demographic factors, personality traits were found to predict e-government adoption among citizens. These include one's risk tolerance and innovativeness (Lin 2003), the extent of the one's pre-existing civic and political involvement (Dimitrova and Chen 2006) and trust of both e-government services and government agencies (Carter and Belanger 2005).

Several media and communication theories draw from the assumption that the user is active and takes rational decisions when making use of a communication medium. They include the 'uses and gratification theory' (Blumler and Katz 1974), the 'technology acceptance model' (Davis 1989), the 'theory of reasoned action' (Fishbein and Ajzen 1975), and the 'media

richness theory' (Daft and Lengel 1984). According to these theories, the user chooses deliberately to adopt a medium or a technology if he or she perceives it as able to fulfil personal needs (uses and gratification theory), easy and useful to adopt (the technology acceptance model), or if he or she believes that adoption or rejection of the technology will lead to the intended, positive consequences (the theory of reasoned action).

The media richness theory argues that each communication medium has a certain degree of richness in terms of social cues. Face-to-face communications are richer than email communications, because the latter lack social cues such as facial and vocal expressions. In an ambiguous situation, people choose the communication medium that offers the greatest richness. Other theories, such as the 'social identity model of deindividualisation effects' (SIDE model) (Lea and Spears 1991) and the 'reduced social cues model' (Sproull and Kiesler 1986) argue that this lack of social cues in the on-line conversations expose people to de-individualisation effects. According to the reduced social cues model, deindividualisation causes people to feel less bonded to social norms and therefore makes them more inclined to behave aggressively. As a result, on-line conversations are more difficult to manage and regulate. According to the SIDE model, the anonymity of the computer-mediated communications makes social identity more salient. Thus people are more inclined to adopt group norms (Spears et al. 2001).

The 'diffusion of innovation theory' (Rogers 1995) endeavours to account for the diffusion of an innovation within an organizational setting or within society. The diffusion depends on both the individual characteristics of the users and organizational structure. For example, Rogers advocated that early adopters of technology are typically better educated, younger and with a relatively high income. At the firm level, the adoption of innovative technology may depend on the leader's attitude toward change, and the centralization and openness of the organization's structure. Other organizational characteristics of the local government including type and form of government and metropolitan status (Moon and Norris 2005), level

of innovativeness, technology and management capacity, and stakeholders' influence (Oliveira and Welch 2013). These have been found to affect the propensity of an agency to use web technologies to communicate with citizens.

Communication practices do not take place in a vacuum. They are profoundly embedded in a context that constantly influences them. In this respect, studies and theories have acknowledged the importance of contextual factors when considering media adoption and consumption and communication preferences. For example, the 'socio-technical systems theory' (Trist and Bamforth 1951) advocates that the adoption of technology cannot be fully understood without considering the context in which technology is embedded and the resulting organizational goals. 'Activity theory' (Vygotsky 1978) considers behaviours as they occur in a social context. In pursuing an object-oriented activity, this theory offers a means of understanding correlations between an activity system (subject, object, artefact, etc.) and contextual and cultural factors.

The 'communication infrastructure theory' (Ball-Rokeach et al. 2001) draws from a communication ecology approach and argues that storytelling networks interact in communication. This occurs both at a micro level (e.g. family, neighbourhood) and a meso-level (e.g. community organisations, local level). This context encompasses psychological, social, physical and technological factors. It can either facilitate or hamper their communicative activities. 'Media dependency theory' (Ball-Rokeach and DeFleur 1976) postulates that the social system has a direct effect on both media dependency, which varies with the nature of the political, social and cultural system, and according to an audience's needs. The extent to which a person depends on the media derives from the needs that the media allow him or her to fulfil (the more needs are fulfilled, the greater media dependence will be. It also depends on social stability, as in crisis situations people exhibit greater media dependence because of their increased information needs. Contextual factors may have a significant influence on the way in which risk and disaster information are

communicated, received, interpreted and acted upon. For example, living in a country with nuclear power plants was found to predict supportiveness of nuclear energy and major awareness of risks and benefits (Kovacs and Gordelier 2009). The understanding of the context, namely of the set of cultural, social, economic, historical and technological elements that shape human behaviours and risk perception provides guidance for the enhancement of risk communication (Twigg 2003).

Lastly, Hofstede's model (1980) has been widely used around the world to account for the elements that distinguish communication patterns in different cultures. The model takes into account different dimensions, such as individualism and collectivism; the avoidance of uncertainty (the extent to which the members of the society tolerate uncertainty and ambiguity in relationships and communication); power distance (strength of the social hierarchy), masculinity-femininity (task-orientation versus person-orientation); and long- or short-term orientation. Several studies have demonstrated that some of the cultural dimensions identified in Hofstede's model correlate with the propensity to use information and communication technology (ICT) and e-government services in society. For example, Shane (1992, 1993) and Rinne et al. (2012) found that countries with greater strength of social hierarchy (high power distance) were less likely to accept innovation (including the adoption of new technology). Shane (1993) argued that innovation challenges the established power hierarchies, implying that nations with high power distances are more reluctant to innovate. Likewise, other studies showed that power distance and avoidance of uncertainty correlate negatively with adoption of ICT (Erumban and Jong 2006; Leidner and Kayworth 2006; Al-Hujran et al. 2011) and use of e-government services (Al-Hujran et al. 2011; Ali et al. 2009; Akkaya et al. 2012).

In addition to communication theories, social psychology theories have also been used to account for on-line communication behaviours (Spears et al. 2001; Riva 2002). This should not come as a surprise if we consider that computer-mediated communication (CMC) has profound effects on

how we define others and ourselves as well as on preserving or challenging power relationships through linguistic instruments (Spears et al. 2001). Notably, 'social identity theory' (Tajfel and Turner 1986) and 'self-categorization theory' (Turner 1987) posit that the self is defined on a continuum whose ends are represented by either a sole individual identity (the self is defined as an individual) or a single social identity (the self is defined as part of a group). Which of these identities becomes more salient, depends on the context and the situation in which the person is situated.

One consequence of the social categorisation of the self is that people tend to reduce and minimise the differences among members of the in-group and exaggerate inter-group differences (group polarisation). In other words, when social self-categorisation is more salient, we tend to conceive of ourselves as interchangeable with other members of the in-group and make our behaviours conform to the group rather than to individual norms. Another consequence of the social identity is in-group favouritism, namely a more positive representation of the in-group compared to the out-group. As well as being depicted in negative terms, the out-group is also subject to stereotyped representations. The SIDE Model (Lea and Spears 1991) builds on self-categorisation and social identity theories and advocates that, as an effect of group anonymity, people that engage in on-line conversations are more inclined to adopt a group identity (deindividualisation). The result of this is increased group polarisation, the adaptation of communicative behaviours to group norms and a massive use of stereotypes to describe out-groups.

Other social theories have been used to contrast the idea that the reduced social and relational cues that can be transmitted through on-line communications imply that these latter are less able to support the creation of intimate relationships. For example 'social information processing theory' (SIP) (Walther 1992) posits that when building relationships people adapt their communicative behaviours to the communication cues offered by the medium and the situation. The consequence of this is that, although

requiring more time to be developed, on-line relationships can be as intimate as those that are created face to face (Riva 2002). 'Situating action theory' (Suchman 1987) and 'positioning theory' both supports the idea that the context is co-constructed by people, who are understood as social actors that exchange and negotiate meanings through communication behaviour. People's actions (including communication behaviours) derive from their adaptation to the context. This is interpreted through the lens of cultural norms, which are, however, constantly modified by a subject's behaviour.

3.4. Research methodology

This section offers an overview of the research methods used to collect data in both case studies. It is acknowledged that the case studies present peculiarities that required data collection methods to be adapted to each specific context. Under the scope of this research, the term 'context' refers to the social setting in which the disaster has occurred, understood as the intersection of interdependent and interacting actors, events, problems, activities, initiatives and pre- and post-disaster dynamics. As for this research, the 'contexts' analysed, the Emilia-Romagna (Italy) and Canterbury (New Zealand) regions, will be described in detail in the following chapters. Thus, more information about the specific data collection methods applied in each case study can be found in the Chapters 4 and 5.

As recommended by Yin (1984) and Eisenhardt (1989), data on post-disaster communication were gathered for both case studies using a variety of methods, both qualitative and quantitative. Stemming from the assumption that communication is never a one-way process, the two actors of the communication (in this case authorities and citizens) were consulted. How does communication by the authorities involved in reconstruction, understood as government agencies, occur and how do they use social media technology? How do citizens communicate and use social media during disaster reconstruction?

To begin with, in order to collect preliminary data on the response phase and transition to recovery and reconstruction, and on key events and problems of the PDR context, an analysis of the post-disaster context was undertaken. The main stakeholders of the communication landscape were identified, along with the communication and public engagement campaigns that they conducted. Information on the case studies under analysis was gathered through informal interviews with researchers or practitioners who had previously worked on these disasters and by browsing through scientific literature and newspaper articles. In addition, I looked up information on websites and logged onto social media profiles of government agencies and community-based groups. This preliminary analysis of the research context had the effect of guiding the creation of research instruments and defining the subjects of the research. Nonetheless, contextual analysis was on going throughout the study. As the data collection was underway, new information about the research context was discovered and added to the contextual framework.

Notes of observations and conversations taken during the fieldwork were used to penetrate the research context, gather first-hand insights into the phenomenon being studied directly from the actors involved and, in turn, make sense of the data collected by other methods. When applying a naturalistic approach in disaster research, field research is essential (Phillips 2014).

After having constructed a preliminary contextual framework for the analysis of the communication dynamics in the specific PDR context, I proceeded to sketch out the research instruments. To begin with, two questionnaires were designed *ad-hoc*, one for the authorities and one for citizens. The questionnaires aimed to investigate communication practices by government agencies and citizens and the role of social media from a quantitative perspective in order to identify trends and patterns in such communication. In the first part, the survey collected knowledge on the content, channel and target of reconstruction-related information. In the second part, attitudes were investigated regarding the use of social media

to communicate during disaster reconstruction. Motivations and barriers to the employment of this technology for the stated purpose were also investigated. By doing this it was possible to gain knowledge of the state of the art regarding communication and the adoption of social media during the emergency phase. Finally, socio-demographic data on the respondents were collected in order to gain insights into the characteristics of the senders of information. More details of the questionnaires will be presented below and copies of the entire documents can be consulted in the Appendices.

In order to expand and enrich the data collected through questionnaires, over a six-month period I conducted structured observation of the government agencies' websites and social media profiles. This observation sought to evaluate (a) the presence on government websites of specific sections dedicated to information about PDR; (b) the presence of web pages dedicated to information about PDR; (c) types of social media used by the government agencies; and (d) the use of social media to inform people about PDR and to build dialogue with citizens.

Although the two case studies are to be intended as cross-sectional (because data were collected in a specific point of time), informal interviews in the Emilia study shed light on the need to adopt a more longitudinal perspective in order to capture how information and communication needs evolve as the reconstruction process unfolds. In theory generation from cases studies, the addition of other research methods or the modification of the research instruments is allowed in order to test emergent concepts (Eisenhardt 1989). For this reason, short, semi-structured interviews with government officers and the representatives of community groups in the Christchurch case study were used to further expand the analysis. This additional research method yielded information on the communication landscape enriched by direct accounts from those who were involved, as well as accounts of the evolution of the communication practices during the reconstruction period.

More details of the questions, scope and results of the interviews can be

found in Chapter 5.

3.4.1. Building the questionnaire

The questionnaire for both authorities and citizens was divided into two sections. The first section investigated communication practices in terms of (a) information provided to citizens or sought by them; (b) channels used to provide or seek information; and (c) the targets of communication. The second section was specifically dedicated to the communication via social media in terms of (a) attitudes towards the use of social media to communicate with citizens or authorities; (b) motivations for the use of social media; (c) barriers to the use of social media in PDR; (d) the type of social media used to develop a two-way conversation with citizens or authorities; and (e) the frequency of use of social media for this purpose. Before administering the questionnaire, an information sheet explaining the goals of the research and the anonymity of the responses was provided. The sheet also included the definitions of some key-terms within the questionnaire such as “reconstruction phase”, “social media” and “two-way communication”. The recovery process was defined as the period after crisis time needs have been met and “where deliberate actions are undertaken to routinize everyday activities of those individuals and groups whose daily routines have been disrupted. These activities may restore old patterns and/or institute new ones” (Quarantelli 1999, p.3). The period considered for this study extended to three months afterwards. Social media were defined as communication services employing on-line information and communication technologies and allowing the exchange of user-generated information and the interaction between people. Two-way communication was defined as communication characterized by the interaction between all the people involved, during which each is given the opportunity to post queries, comments and requests or complaints and to obtain a reply.

Demographic data on the respondents were also gathered. The survey included mostly partial multiple-choice questions (responses offered an “Other, please specify” option), whereas statements in accord with a five-

point Likert scale measured attitudes towards the use of social media in reconstruction (Gouldthorpe and Israel 2014).

Question 1 investigated the information provided or sought during the reconstruction process. Respondents were asked to tick the most relevant information and up to three responses were allowed. Literature on disaster reconstruction, in particular the handbook by Phillips (2009), was used as a guide to define the relevant aspects such as housing and infrastructure reconstruction, and business and environmental recovery. In the question on the communication channels used, people were asked to indicate the frequency of use of each channel to provide or seek the information selected in question 1, on a four-point Likert scale ("never, rarely, fairly often, and very often"). In question 3, respondents were asked to choose from a list of social groups and government agencies from which they had sought the information selected in question 1 or to which they had provided it. Participants were allowed to select all the options they considered relevant or add an alternative answer in the section "Other". In order to build the answer options to this question, key actors among the authorities and citizens involved in each reconstruction process were interviewed.

The second part of the questionnaire (questions 4 to 9) was intended to investigate the potentialities of using social media to support communication between the authorities and citizens in the reconstruction phase. Question 4 prompted respondents to state their level of agreement with several statements designed to investigate their attitudes towards the use of social media to communicate with the authorities and citizens on a five-point Likert scale ("Disagree, Somewhat disagree, Neutral, Partially agree, and Agree").

Questions 5 and 6 aimed to investigate citizens' and authorities' motivations and barriers to the use of social media in the reconstruction phase. The answer options for the question 5 partially mirrored the categories of participation described by Arnstein's ladder (1969). This strives to account for the different levels that citizens' participation can take. On the bottom rungs of the ladder (manipulation and therapy),

citizens are not involved but they are educated and manipulated by the authorities above them. On the middle rungs of the scale, people are informed and can state their opinions about key decisions, but their voices will not necessarily be heard by power-holders (this is tokenism). On the top rungs (partnership, delegated power and citizen control), citizens share the power with the authorities and manage social change. Accordingly, authorities may use social media for anything from informing the public about reconstruction (a low level of engagement) to enabling it to participate actively in the reconstruction planning process (a high level of engagement). Similarly, citizens may use social media either merely to read reconstruction-related information or to partner with the authorities in the resolution of reconstruction-related issues and propose regulations and policies to improve the reconstruction process. Another possible option was that social media were used to collaborate with other citizens rather than with the authorities. Again in this case the option "Other-specify" was provided.

With regards to the barriers that hamper the use of social media to communicate in the reconstruction phase, answer options were determined using the type of barriers identified in previous literature on social media usage in disaster response and in national statistics on social media adoption by citizens and government agencies. As for the question on the motivations of use, respondents were asked to select the two most relevant barriers.

The final questions investigated the adoption of social media by citizens in order to communicate bi-directionally with the authorities. Those who declared that they had used social media for this purpose during the reconstruction phase were also asked which social media they had used and with which frequency.

Piloting a survey is advisable to test the feasibility of the study and that the research instrument fits the scope of the research. However, a proper pilot study often implies additional funds and resources, i.e. more time and people involved and a large sample to pick from. In consideration of the

resources and time required to pre-test four different surveys (one questionnaire for authorities and one for citizens in two different reconstruction settings), I decided to proceed without full testing of the questionnaire in pilot form. However some precautions were taken to ensure the appropriateness of the research tool. For the Emilia-Romagna case study, the questionnaire was first reviewed by other researchers and then administered to a small sample during the field trip. In doing so it was possible to spot possible pitfalls or incongruences. After this, the questionnaires were distributed widely on-line and through community-based groups. For the Canterbury earthquakes case study, the questionnaire was revised by a researcher of Lincoln University near Christchurch who had already published research on the recovery and reconstruction process in the area. This allowed the questionnaire to be adapted to both the specific features of the recovery process and the local culture. The resultant editorial changes made to the questionnaire in both terminology and answer options are described in Chapter 5.

3.4.2 *Defining the participants*

Before administering the questionnaires, criteria were defined for the inclusion or exclusion of the respondents from the final analysis. As for the authorities, participants were asked whether or not they worked in an agency that dealt with the reconstruction process. Only those who responded positively were recruited to the survey. They were also asked whether they used social media within their institutions, including the case in which they used their personal accounts for institutional communications. Both users and non-users were recruited. With regards to the questionnaire for citizens, only people who still resided in an area where the reconstruction process was underway were considered eligible. In doing so, only the respondents for which recovery was still a contingent matter were selected. Especially for on-line surveys, there is a risk that answers are received from people who live outside the affected area but that are generally interested in reconstruction-related issues. Again, in this case both users and non-users of social media were recruited. The

rationale for recruiting non-users consisted of the need to compare communication habits and preferences of citizens and authorities during the PDR phase with specific socio-demographic characteristics.

3.4.3. Recruitment of participants and mode of administration of the survey

The recruitment of the participants took place through a variety of methods and channels. Questionnaires were administered with a mixed-mode methodology either by person (the paper version) or on-line (through a link to the digital version). In both cases, respondents completed questionnaires autonomously. Although a mixed mode of administration might be seen as creating a potential bias when analysing the results, Bowling (2005) found that the influences are greater between different types of response (e.g. self-administered versus interview modes), rather than within modes. The free Google function (<https://www.google.com/forms/about/>) that allows building and analysing surveys on-line was used to collect on-line responses. Recorded respondents were downloadable in Excel-sheet format.

In order to gauge their interest in taking part in the research, the authorities were primarily contacted by email. Those who showed interest were invited to respond to the questionnaire either in person (by meeting me during the fieldtrip time) or using the on-line link. The emails were usually directed to key people who worked in public relation departments or, when available, in departments with specific tasks concerned with reconstruction activities. However, respondents were asked to disseminate the link of the questionnaire to any person in the agency who had communicated with citizens about the post-disaster reconstruction. As such, it was not possible to retrieve data on the response rate.

In order to extend the sample of citizens, I used community-led groups and civil society organisations that had been created after the earthquake. Many of these organisations were only constituted in cyberspace through, for example, Facebook pages. Nevertheless their ability to mobilize people and produce an impact on the reconstruction process should not be

underestimated.

A mixed mode of administration of the survey was applied, either on line or in person. The link to the on-line survey was posted on the social media and web pages of the community-led associations. For the paper version, some community groups were asked to distribute the questionnaire to their audiences.

Use of both on-line and paper versions of the questionnaire allowed maximising the outreach potential of the social media groups (also in terms of having a more distributed contact with the respondents across the affected area) while avoiding the exclusion of people with little to no access to the Internet. Indeed, the main scope of this research was to investigate communication practices and dynamics during disaster reconstruction. Social media-supported practices are one part of the recovery communication landscape, but they are certainly not the only part.

3.5. Data analysis

The data collected via the on-line and paper surveys were analysed using SPSS software for statistical analysis. Two types of analysis were performed on the data: (a) descriptive analysis, in order to identify recurrent trends in the communications and use of social media by government agencies and citizens during the reconstruction processes analysed; and (b) inferential analysis, in order to identify correlations between recovery communication practices and socio-demographic factors that the literature and national statistics suggested might influence the ways in which people and government agencies communicate and interact. In considering the potential effects of the digital divide and the particular characteristics of social media users, notably in terms of their answers about the adoption of technology and use of the Internet (Schillewaert and Meulemeester 2005), results obtained from on-line and written questionnaires for citizens were analysed separately. This enabled

one to check for recurrent practices and variations in the results between both of these groups.

Field notes, consisting of informal interviews with some government officers and photographic evidence, allowed me to collect valuable contextual information that would otherwise have been missed by the quantitative analysis. Rather than analysed in a systematic manner, observations taken in the form of field notes were reported in this research as a series of anecdotes, sentences and photographic evidence that may help the reader to understand better the context in which communication practices take place and correctly frame the research findings.

Structured observations were aimed at gathering qualitative evidence of web-based communications about rebuilding. The general goal of this analysis was to explain how government agencies used websites and social media technology to communicate with citizens about reconstruction. Were apposite sections created within official websites, or were separate pages set up to convey specific recovery messages? Were social media used merely to inform the public about reconstruction processes or were consultation campaigns run by this means to collect citizens' inputs? A quantitative analysis was made to observe the frequency of posting of recovery information on governmental agencies' social media profiles over a period of six months.

For the Canterbury earthquake case studies, several interviews were conducted in order to investigate the evolution of communicative practices over the reconstruction period from the perspectives of both residents and government officers. During my field trip to the areas affected, interviews were mainly carried out face to face. However, a few were collected via Skype (n=2) and telephone (n=1). Interviews were analysed by means of thematic analysis. As expressed by Braun and Clarke (2006), this is a method for identifying and analyzing patterns within data. This approach was considered appropriate to the general goal of this research project, which lies in the identification of regularities in PDR communication. Indeed, thematic analysis allows for flexibility in the identification of

patterns and differences in the data set and sometimes generates unanticipated insights (Braun and Clarke 2006). Furthermore, it is well suited to the need to conceptualize PDR communication by government officers and residents (Joffe 2012).

As suggested by Fereday and Muir-Cochrane (2006) and Joffe (2012), the identification of themes proceeded through a mix of inductive and deductive approaches. On the one hand, pre-existing literature framed research questions, which guided the definition of categories of analysis. On the other, new insights emerged during the analysis. The analysis was geared toward the identification and description of regularities (*semantic themes*) rather than toward the interpretation of patterns. Broader meanings and implications of the themes identified are discussed in Chapter 6 in the context of cross-case patterns and the need to build a framework model of PDR communication. As a further note, and as already mentioned in the epistemology section of this chapter (see section 3.2.1), the analysis built on a naturalistic and constructivist paradigm. Descriptive patterns were considered as socially constructed and inherently linked to the post-disaster environment in which they were produced.

The analysis followed the steps identified by Braun and Clarke (2006) for thematic analysis. Data analysis began during data collection by taking note of recurrent observations. Then, audio-recorded interviews were transcribed and imported into NVivo10 software. Interviews were not transcribed word by word but the general meaning of the sentences was retained. Indeed Braun and Clarke (2006) advocated that what matters is retaining the ultimate significance of the verbal accounts in a way that it remains faithful but suits the scope of the analysis. After the transcription, data were organized into meaningful groups and codes were generated. Similar codes were then collated to produce initial themes. According to Joffe (2012) a theme is a specific pattern of meaning found in the data, which responds to one or more research questions. Finally, the themes were compared against the whole dataset and the codes extracted, refined and named.

3.6. Ethical considerations and ethical approval

Working in disaster-afflicted contexts can pose several ethical issues that need to be acknowledged and addressed (Kilpatrick 2004; Kelman 2005). People who live through a post-disaster reconstruction process experience high levels of distress due, in part, to their need to deal with insurance companies, multiple government agencies and the long duration of the recovery procedures. The literature demonstrates that facing these issues can be more stressful than the experience of the disaster itself (Flynn 1999). It may delay the whole process of recovery.

University College London has a strict procedure to guarantee that ethical issues are adequately addressed before field research begins. An ethical commission decides whether the research will generate substantial ethical issues and assesses the risks to which the researcher is exposed in conducting the study. Generally speaking, studies that involve vulnerable groups (e.g. children, people with disabilities etc.) and that are conducted in high-risk contexts (e.g. during disaster response) or countries (e.g. those with on-going conflicts) go through a complex procedure of evaluation before being approved. Other forms of research may be considered to be at low risk and the approval procedure is therefore lighter.

For the following reasons, my research was considered to be at low risk: -

- *No vulnerable group was targeted.* Participants to the research were all over 18 years old and with no specific vulnerabilities (e.g. people with mental health problems resulting from trauma). Although most of them experienced a disaster and were going through a recovery process, their level of distress was considered manageable taking a series of precautions in conducting the study.

- *The topic of the study was not considered particularly sensitive.* Apart from some socio-demographic data, no sensitive questions were

asked. The study was only intended to gather communication preferences and social media adoption habits by participants during PDR. As the questionnaire was anonymous, no link could be made between the identity of the respondent and the specific responses.

- *No relevant risk to the researcher was detected.* Both case studies were carried out in democratic countries (Italy and New Zealand) with no on-going conflicts. Although they were disaster-prone countries, the risk of being involved in aftershocks was not significant, as several years had passed since the first earthquake. In other words, the risks of visiting the countries were not considered higher than the normal risks one would face in visiting a country in which a disaster may happen.

Given that the study was conducted in a post-disaster context, some precautions were employed in order to guarantee that participants felt comfortable in responding to the questions.

- (a) Before administering the questionnaire or conducting the interview, an information sheet was provided to each participant with a description of the study goals. In addition, participants were invited to contact the principal researcher (myself) by email if they had questions or comments on the study.
- (b) It was made clear that participation in the research was entirely voluntary and that consent to proceed could be withdrawn at any time during the study with no consequences. As the questionnaire was anonymous, it was clarified that it was not possible to withdraw the data after it had been completed and returned. Submission of completed questionnaires implied that respondents gave their consent to participate. For the interviews, this could be withdrawn at any time during and after the interview. Interviewees were asked to sign a consent form before starting the interview.
- (c) It was made clear that the questionnaire was anonymous and that results would be presented only in an aggregated manner so that

no link could be made between the answers and a specific respondent. Although some socio-demographic data were collected at the end of the survey, they were not considered sufficient to reveal the identity of the respondent. In case of the Emilia-Romagna recovery agencies, municipalities were quite small and the risk of revealing the identity of the respondents through its working role was high. To avoid this, the name of the responding agency was not asked for in the Emilia-Romagna case study.

- (d) Those who participated in the interview for the Canterbury earthquake case study were advised that it would be audio-recorded and then transcribed and that some parts of their interviews could be mentioned in the presentation of the final results. However, a guarantee was given that their identity would not be disclosed and that their words would be presented as spoken by them without any distortions or omissions.
- (e) Data were secured in a safe place and disposed of after the analysis was completed. During all the processing, they were stored in my working laptop computer, whose access is protected by a private password. The interviews were labelled with numbers (e.g. "Interview resident 1", "Interview authority 2") in order to make them anonymous.
- (f) In the organisation of the interviews and administration of the questionnaire, every effort was made to find a time and place that suited the specific needs and schedules of the respondent. In particular, for interviews with government officers, extra caution was taken to avoid impeding routine working activities.

As these precautions were taken to make respondents aware of the implications of participating, this research obtained the approval of the UCL ethical committee (Project n. 5427/001).

After the completion of data collection, and in accordance with UCL rules, a report evaluating the ethical issues that arose during the study was

drafted.

Two ethical issues emerged during the data collection phase of the Canterbury earthquake case study.

1. Concerns were raised by at least one government officer about the anonymity of the interview. The post-disaster context in Christchurch has been marked by significant conflicts and tensions over the recovery management and insurance claims, which have led many government agencies to take a defensive approach. In this case, the respondent was reassured that no direct mention of himself or herself would appear in the final results.

2. Another ethical issue emerged during the fieldwork in Christchurch when the questionnaires were distributed during a public meeting of a community-based group. In a post-disaster scenario, residents may use these meetings to obtain crucial information about the status of reconstruction in their home areas. Therefore, the administration of the questionnaire could have distracted them from absorbing crucial information. To avoid this, people were asked to complete the questionnaire if and when they could during the meeting, after it or, as an alternative, to scan and send the completed questionnaire via email.

3.7. Introducing the case studies: the Emilia-Romagna (Italy, 2012) and Canterbury (New Zealand, 2010, 2011) earthquakes

Chapters 4 and 5 of this dissertation describe in detail the two case studies under analysis and the results of the investigation. For each case study, the research context is examined, encompassing a wide range of aspects of the reconstruction process and of both pre-existing and newly created social and communication dynamics. Then, the specific data collection methods and any change in the research instruments are delineated.

Lastly, the results of the data analysis are presented and discussed in the light of the existing literature. .

CHAPTER 4

RESEARCH ON COMMUNICATIONS AND SOCIAL MEDIA USAGE IN THE POST-DISASTER PHASE: THE EMILIA-ROMAGNA EARTHQUAKE CASE STUDY

4.1. Emilia-Romagna earthquake: the events

On 20 May 2012 an earthquake of magnitude 5.9 struck Emilia-Romagna region in northern Italy (Figure 4.1). Soon after the earthquake a network of sensors was set up in the affected area to monitor seismic activity. Historically, the region was known as a zone at moderate seismic risk (Moretti et al. 2013). The main shock was followed by several minor aftershocks and by another major event on 29 May 2012 (magnitude 5.8) (Moretti et al. 2013) with epicentre 15 km northwest of the former event. The two events caused 29 deaths and 390 injuries, and 900,000 people were affected in 58 municipalities. More specifically, the impacted area included 33 municipalities spread across four provinces and 550,000 residents. (Figure 4.2) (Action Aid 2014).

The most seriously affected town in the region was Cavezzo, but historical buildings such as churches, clock towers and castles were also damaged or collapsed partially in other cities (Rossetto et al. 2012).

Chapter 4. Research on Communications and Social Media Usage in the Post-Disaster Phase: the Emilia-Romagna Earthquake Case Study



Figure 4.1. Location of the Emilia-Romagna region in Italy. Source: <http://www.turismoitalia.it/emilia-romagna.php>

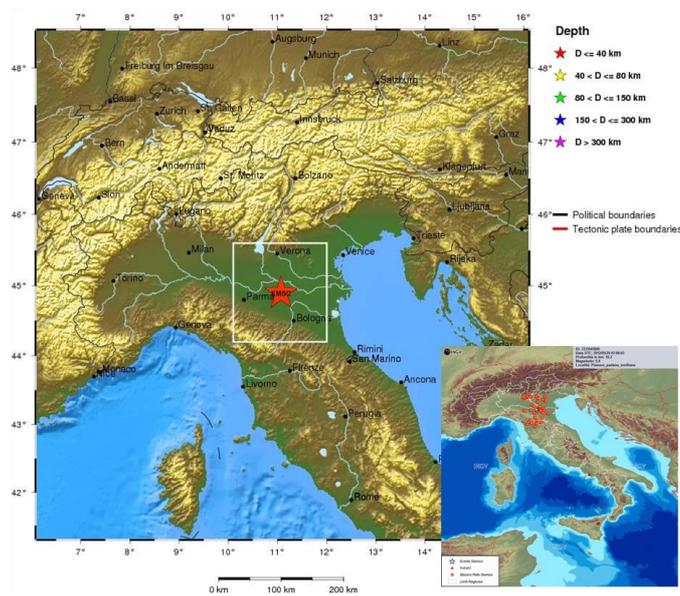


Figure 4.2. Epicenter of the Emilia-Romagna earthquake of 29 May 2012. Source: <http://www.eqclearinghouse.org/2012-05-20-italy-it/2012/06/18/report-of-the-29th-may-earthquake/>

Notably, significant damage occurred in the industrial facilities within industrial zones such as Cento, Cavezzo and San Biagio and in factories and agricultural lands in the region.

The Emilian context presents some unique peculiarities that need to be acknowledged. Historically, Emilia-Romagna is one of the most economically productive regions of Italy with high industrialisation and intensive and diversified agricultural production (Russo et al. 2016). The development of a regional innovation system (Bianchi and Labory 2011) based on civic values of mutual trust and partnership between civil society organisations and local authorities (Putnam 1993) has made this region particularly resilient to crises (Brusco 1982). From the standpoint of the economy, according to Brusco (1982) the origin of Emilian resilience rests in the high decentralisation of the productive structure that consists of small enterprises spread across the region. The local economy responded to mass production tendencies by investing in diversifying the production and ensuring the quality of its products. (Brusco 1982). The industrial fabric of the 33 municipalities impacted by the 2012 earthquake was diversified as well, including, for example, the manufacturing, engineering and biomedical sectors. In 2012, due to the financial crisis, all these sectors suffered a drop in employment (Russo et al. 2016). Despite this, as it has 550,000 residents, the area still produces around 2% of the national gross product (Action Aid 2014). The agricultural sector also contributes greatly to the local economy. In 2010, the incidence of agricultural activities in the municipalities affected was 17.6% of the regional agricultural area (Russo et al. 2016). The well-known Parmigiano Reggiano cheese exported all over the world is produced in this region and the production was badly impacted by the earthquakes. The importance of the Emilian economy at the national level made the regeneration of industry and employment one of the recovery priorities (Arcidiacono and Cimellaro 2013). Historically,

decentralisation tendencies in the Emilian context have been evident also in governance: local municipalities were efficient in managing and organising public interventions, while the central state played a lesser role (Brusco 1982). High levels of social capital (Putnam 1993) and the formation of civil society organisations at the local level - traditionally inspired by communist or catholic values - assured further decentralisation.

These historical and cultural characteristics have had great influence on the post-disaster decisions and on the recovery model adopted.

On the decisional side, the response and early recovery phase lasted about 90 days. Italy's emergency management system, named "Augustus" after the Roman Emperor, is organised on a cascading basis (Alexander 2010). At a very local level, mayors are the primary civil protection authority in their municipalities. In case of a large disaster, the responsibility escalates through the provincial and the regional levels to the national level (European Commission website, no date).

As the Augustus system for emergency planning was applied, different management and decisional centres were created after the earthquakes in Emilia-Romagna: the *Centro operativo comunale* (COC), or municipal operations centre; *Centro coordinamento soccorso* (CCS), a larger municipal operations centre with responsibility for coordinating nearby smaller ones; and *Centro operativo regionale* (COR), the regional operations centre. Finally the *Direzione comando e controllo* (DICOMAC), or national command and control centre, coordinated all the other centres at the national level (Action Aid 2014). Decree no. 74 issued on 7 June 2012 established "Urgent interventions in favour of the affected population". As a result of this decree (then turned into a law in July 2012), the President of Emilia-Romagna Region, Mr Vasco Errani, became Special Commissioner for Reconstruction (*Commissario Straordinario per*

la Ricostruzione) and the mayors of the municipalities affected sub-commissioners.

In order to coordinate activities related to the reconstruction, the Institutional Committee for the Reconstruction (*Comitato istituzionale e di indirizzo per la ricostruzione*) was established, consisting of the President of the Emilia-Romagna regional council, the presidents of the provincial councils and the mayors of the municipalities affected (Regione Emilia-Romagna 2015). From 2 August 2012, the Regional Council took charge of the management of all the reconstruction process while the national civil protection authority ended its activities. The state of emergency declared on 22 May 2012 was repeatedly extended so that it prevailed until the end of 2015 (Regione Emilia-Romagna 2014b). From the very first stages, the Special Commissioner decided to make limited use of temporary shelters such as tent camps and container homes and to allocate funds for the so-called *contributi di autonoma sistemazione* (CAS, funds for self-organised accommodation). In general, the first interventions were geared towards avoiding the creation of *new towns*, as had happened in the wake of the L'Aquila earthquake of 2009 (Associazione "Libera" 2014).

4.2. The reconstruction phase: research context

4.2.1. Research context: Key events and problems (2012-2016)

In May 2012, in occasion of the second anniversary of the earthquake in Emilia-Romagna, Action Aid, one of the organizations promoting the OpenRicostruzione Project, issued a report describing the activities carried out in the first two years of reconstruction (Action Aid 2014). In the same month, the Emilia-Romagna Regional Council presented another report titled "Two years after the earthquake - the story of what we have done and

what we are doing” (Regione Emilia-Romagna 2014a). Both of these reports claimed that the reconstruction process in Emilia-Romagna was a collaborative process in that its priorities were not set by a central authority but were established in collaboration with local governments and actors (Action Aid 2014; Regione Emilia-Romagna 2014a). Indeed, although legislative power remained in the Special Commissioner’s hands, the content of the decrees was negotiated with the single municipalities, which could present doubts and concerns. Moreover, the final version of the decree left room for flexibility in its application so that the mayors could better apply it to the specific situation and problems in their own municipalities (Mayor of Bomporto, personal communication). On the one hand, this offered the flexibility necessary to manage a complex reconstruction process in such widespread area. On the other, it opened the space for complaints from the local population due to the very different applications of a single decree.

From June 2012 to May 2014, in order to manage the reconstruction process, 290 decrees and one regional law (n.16/2012) were issued by the Emilia-Romagna Regional Council (Regione Emilia-Romagna, 2014a,b). Despite this, the whole process was slow due to the lack of a clear legislative framework capable of providing direction. Indeed, in March 2012, two months before the earthquakes, the national Government announced the re-organisation of the Civil Protection system by means of decree no. 59/2012. The decree was turned into a law (no. 100/2012) in July 2012 incorporating several amendments that were intended to respond to the evolving emergency situation in Emilia-Romagna. While the previous legislative framework tasked the civil protection authorities with the management of all the emergency phases, the new law established that the public administration had to deal with the mitigation and recovery phases (Action Aid 2014). Public administrators in Emilia-Romagna found

themselves defining a system of laws and decrees in time of crisis (Regione Emilia-Romagna 2014b; Action Aid 2014). In addition, in order to meet the specific needs of the municipalities, the decrees went through several re-adjustments, which made the whole legal system of reference variable (Regione Emilia-Romagna 2015). Both the reports mentioned above and personal communication by key decision makers gathered during the field trip by the author confirmed that the actual reconstruction started in the first half of 2013 when the subsidy that could be claimed for private reconstruction was increased from 80% to 100% of the costs of rebuilding.

The interventions for the reconstruction have focussed on several areas: (a) reconstruction of schools; (b) public works and support to local businesses and companies, and (c) actions in favour of families and social support. With regards to schools, the priority was to make the school system functional by September 2012, the beginning of the academic year. With this goal, where severely damaged, the schools were relocated to new or existing undamaged buildings. The same thing happened for the municipal offices. In Cavezzo, for example, the municipal offices were moved and shared the spaces with the local school, whereas in Mirandola new buildings were created for both the school and the municipal offices (personal investigation) as shown in Figure 4.3. According to the original plan, these new buildings will be dismantled once the original buildings have been repaired.



Figure 4.3. The new building of the city hall in Mirandola. Besides to it, a new school for the town has been built. Source: Comune di Mirandola website

With regard to public works, as of 2014, 1,540 interventions had been carried out, including 541 works on public assets and 999 on cultural assets. In 2014, these works were still at a very early stage due to delays in allocating resources and to the floods that struck the region in the first months of the year (Action Aid 2014). A report released in 2015 by the Emilia-Romagna Regional Council indicated that the reconstruction was proceeding well for both the residential and commercial buildings as well as for the revitalisation of the economic sector (Regione Emilia-Romagna 2015). However local and national newspapers commented that only 60% of the buildings were reconstructed and that many other critical situations (such as people who were still living in temporary shelters) were still unresolved (Il Fatto Quotidiano 2015). In April 2014 a series of new decrees was issued to support the revitalisation of the historic centres that had been severely damaged by the earthquake (Regione Emilia-Romagna 2014a). Figure 4.4 shows the works undertaken on historical and cultural assets in Mirandola town centre.



Figure 4.4. Historical centre of Mirandola. Photo taken during the field trip in April 2014.

On the private sector side, the regeneration of the local companies and businesses has been one of the priorities. Despite the satisfactory amount of funds allocated for the reconstruction, and several tax breaks and benefits for the local businesses (Provincia Bologna 2012), there were severe delays in the distribution of these funds to the industries in need (Gazzetta di Mantova 2015). In many cases, local industries, which already experienced difficulties due to the financial crisis, had to pay in advance for materials and repair works. Some local actors complained about a different level of bureaucracy in the public and private works. In their opinion, while private citizens had to manage a plethora of administrative procedures, the allocation of funds to repair public facilities was much easier (SulPanaro 2014).

A good practice to be mentioned is that local businesses and shops, when located in damaged historic town centres, received funds to relocate temporarily into nearby shopping malls. Once the buildings were secured and the roads re-opened, other funds were offered to allow them to return

to their previous locations (Mirandola Town Council Secretary, personal communication). By doing so, it was possible to prevent the complete abandonment of the historic town centres. In other cases, innovative solutions for local businesses and shops were found. A notable example is the shopping centre created in Cavezzo (the most affected town) and named “Cavezzo 5.9” by the magnitude of the earthquake. The shopping centre was entirely constructed out of shipping containers, which had previously been used for other purposes (Figure 4.5). Interestingly a similar solution was used to revitalise the city centre in Christchurch (New Zealand) after that two major earthquakes devastated the central business district in September 2010 and February 2011. The 'Re:Start Mall' in Christchurch offers a wide range of shops housed in shipping containers. The best practices and shortcomings of the reconstruction process in Christchurch will be discussed extensively in Chapter 5.



Figure 4.5. The shopping centre “ Cavezzo 5.9” constructed using containers. At the end of 2016, the containers have been dismantled and donated to the population affected by the Central Italy earthquake in August 2016. Photo taken during the field trip in April 2014.

With regards to actions in favour of the families and to social support, the Italian Government offered several options to accommodate affected people. Most people decided to accept the funds allocated to help them find temporary accommodation, the so-called *Contributi di autonoma sistemazione* (CAS). Others were rehoused in rented accommodation or in temporary containers (MAP, *moduli abitativi provvisori*). Regarding this last point, the Government tried to minimise the use of temporary containers (figure 4.6) in order to prevent people spending years in such accommodation (Regione Emilia-Romagna 2014a).



Figure 4.6. Containers in Mirandola. Photo taken during the field trip in April 2014

Since the very early stages, people affected could request to be reimbursed up to 80% of the total cost of repair works. In February 2013, a new decree increased the potential refund to 100% of costs (Regione Emilia-Romagna 2014b). One of the main complaints concerning the allocation of funds to private citizens was that those who had received the refund were then asked partially to repay it through an increase in their taxes.

One of the key-events in the Emilia-Romagna reconstruction was the scandal of the so-called "Ichese report" (*Rapporto Ichese*). During the last months of 2013, the Emilia-Romagna Regional Council requested to a committee of experts to gauge whether fracking activities, in particular in the areas of Cavone and Casaglia in Modena Province, could have triggered the earthquakes in 2012. This topic is greatly discussed among the scientific community but no certain correlation has been found (Walsh 2014). The study concluded that a correlation between the 2012 earthquake and the fracking activities *could not be ruled out*. The Emilia-Romagna authorities received the report at the beginning of 2014 but they kept it secret until the results were published by the journal "Science" in April 2014 (Carlidge 2014). One month later, the Emilia-Romagna Regional Council was forced to acknowledge that they were aware of the report's results and to make them public on their own website (Giliberto 2014). The citizens' reaction to this scandal has been focused on (a) asking about the motivations for keeping a document of such great interest secret from the public; and (b) asking for the interruption of the fracking activities in Emilia- Romagna Region. The scandal triggered a series of press releases by regional and local authorities to explain and clarify the results of the study and to re-assure the population about the lack of correlation between the two events.

4.2.2. Research context: Key actors in the reconstruction between authorities and citizens

On the administrative side, Italy is divided into 20 regions, 109 provinces and 8,104 municipalities. Provinces are administrative sub-divisions of regions. The Parliament has the legislative power to issue laws, which require the approval of both the Houses of Representatives before being enacted. In case of an emergency, the Government can temporarily issue

a law decree *in lieu of* a law provided that the decree is turned into a law with 60 days.

The reorganisation of the Italian Civil Protection system was announced in March 2012. This meant that the management of disaster mitigation and recovery activities was transferred from the National Civil Protection department to regional and local authorities. However, at the moment of the earthquakes in May 2012, the law had not been implemented yet. For this reason, on 6 June 2012, the Government issued Decree no. 74 to set emergency institutional arrangements for the management of the recovery process in Emilia-Romagna. On this basis, the Presidents of the Regions affected by the earthquake in 2012 became Special Commissioners for the Reconstruction (Regione Emilia-Romagna 2014b) and the mayors were sub-commissioners. The decree was turned into a law (no. 100/2012) in July 2012. From August 2012 the Regional Council took charge of the management of the whole reconstruction process and the National Department of Civil Protection ended its activities in the region. Nonetheless, civil protection activities were still undertaken by regional, provincial and municipal authorities.

As far as the reconstruction in Emilia-Romagna is concerned, legislative power remained mainly at regional, provincial and municipal levels. During the course of two years (2012-2014), the Special Commissioner issued several directives and decrees in order to manage the reconstruction process. At the local level, municipal offices managed different aspects of the reconstruction (e.g. social support, urban planning and the school system). Mayors coordinated the recovery activities and negotiated the content of the decrees with the regional level, providing inputs and insights into needs and critical situations at the local level. Likewise, the provinces provided a further level of coordination of reconstruction activities. Besides government offices, other agencies such as the local fire services and

police stations offered their support, especially in the first stages of the reconstruction in order to gauge the amount of damage and the safety of the buildings. In August 2012, a new monitoring organization, called GIRER (*Gruppo Interforze per la Ricostruzione in Emilia-Romagna*) was established at the headquarters of the Criminal Police with the aim of creating a “white list” of companies contracted for the reconstruction and avoiding the penetration of organised crime into the reconstruction process (Ministero dell’Interno 2012). All the orders and decrees issued can be consulted on the section of the Emilia-Romagna Regional Council dedicated to the reconstruction (<http://www.regione.emilia-romagna.it/terremoto>).

On the citizens’ side, a large number of committees and citizens’ associations were created both at the local and cross-regional levels. These committees took forward a project of the reconstruction then named “*Dal basso alla Bassa*”, whose main goal was to prevent a top-down control of the reconstruction process and to promote transparency and community engagement (Hajek 2013). Indeed the term *Bassa* indicates the area affected by the earthquake (*La bassa bolognese e modenese* - i.e., the floodplain) while the term *basso* (which in Italian means “bottom”) was meant to indicate a project created by and for the population (i.e. “bottom-up” - Hajek, 2013). This scenario is consistent with the description by Quarantelli (1985) and Stallings and Quarantelli (1985) of the emergent groups during disaster recovery. These groups emerge as a result of the perception that the authorities are not addressing a pressing need. Consequently they often have a combative nature and refuse to identify with political parties (Stallings and Quarantelli 1985). However, in a few cases these organisations end up engaging openly in political activities. As an example, Sisma.12 (<http://sismapuntododici.blogspot.co.uk>) has been one of the most politically active committees in the Emilian reconstruction

landscape. It led several civic struggles to inform people, within and outside the Emilia-Romagna region, about the difficulties that people have encountered during the reconstruction. Besides organisations that tackle general issues, other groups have had a more local nature and have focused their activities in specific towns or areas and on specific problems (Stallings and Quarantelli 1985). “*Cinquepontonovi*” and “*Comitato Elementari Concordia sulla Secchia*” can be included in this category. Finally, the advent and rapid advancement of new communication technologies have brought to the prominence other committees that exist merely as on-line groups for information sharing on the reconstruction. “*Magnitudo 5.9*”, “*Finale Emilia Terremotata Protesta*” and “*Rovereto Terremoto*” are all examples of the latter. Overall the reconstruction process in Emilia-Romagna has been characterised by the widespread creation of groups of citizens, which have served as a counterpart (and sometimes as an opponent) to the dialogue with local and regional authorities. Table 4.1 lists some community-based groups involved in the earthquake recovery in Emilia-Romagna, which were used for the distribution of the questionnaire.

4.2.3. Research context: monitoring and participatory activities during the reconstruction phase

The activation of monitoring and participatory activities is a paramount means of making post-disaster reconstruction more transparent and free of criminal influences. During post-disaster reconstruction in Emilia, several of these activities were put in place. To start with, there was the OpenRicostruzione Project, initiated by the collaboration between Emilia-Romagna Regional Council, ANCI (the Association of Italian Municipalities) and other associations that work on civic participation (e.g. ActionAid and

OpenPolis). This project includes a web portal (<http://www.openricostruzione.it>), which provides citizens with relevant information on the reconstruction process and allows them to follow the development of projects and track the use of donations.

In addition, the project aims to give citizens the skills and tools to participate actively in the reconstruction. For this reason, ActionAid organized a series of workshops on data journalism in order to train citizens to monitor reconstruction by analysing data and maps on the Web and taking pictures of the recovery works (Shoot4Emilia). The blog page on the web portal aims to chronicle these participatory initiatives. Also, the Emilia-Romagna Regional Council launched a new website (<http://www.donazionisisma.it>) which provides an overview of the amount of donations received and of the projects funded.

In January 2014 the “Observatory on the Reconstruction” was established with the intention of helping prevent criminal influences. The Observatory was coordinated by “Libera”, an association active in countering criminal organizations (Associazione “Libera” 2014). The key point of this initiative was the engagement of a wide range of stakeholders from citizens' associations to local, regional and national authorities. Additionally, as noted above, a “white list” of the companies hired to execute the reconstruction works was established. The white list guaranteed that the companies contracted were not related in any way to criminal organizations. Despite all these efforts, in 2015 it became evident that some local professionals and companies involved in the reconstruction had collaborated with criminal organisations, notably with the mafia from Calabria (called “*Ndrangheta*”). The investigation, named “Aemilia”, resulted in many professionals being jailed and in the initiation of a long trial (La Repubblica 2015).

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Table 4.1. Some community-based and on-line groups involved in earthquake recovery activities in Emilia-Romagna

Name	Scope	Just on cyber space?	Area	Facebook	Twitter
Comitato SismaPuntoDodici	A place to share ideas, projects and information on the reconstruction	No	Troughout the affected area	Sisma.12 – Comitato Ricostruire la Bassa dal Basso	@SISMA_21
CinquePuntoNovi	Cultural association active in many recovery activities	No	Novi di Modena (MO)	Cinque Punto Novi	@CinquepuntoNovi
Una scuola per Mirandola	Collecting funds to rebuild and repair schools damaged by the earthquake	No	Mirandola (MO)	Una Scuola Per	@1ScuolaXMiran
Magnitudo 5.9	Collecting voices and opinions from the affected area	Yes	Mirabello (FE) - Troughout the affected area	Magnitudo 5.9 – Mirabello 2012	@Magnitudo59
Ricostruiamo Creva	Group to propose reconstruction initiatives	Yes	Crevalcore (BO)	Ricostruiamo Creva	-
Comitato Elementari Concordia sulla Secchia	Collecting funds for the school in Concordia sulla Secchia	No	Concordia sulla Secchia (MO)	Comitato Elementari Concordia Secchia	-

Several other initiatives are also worth mentioning. The initiatives related to the reconstruction were generally aimed at making this process more participative by asking the residents how they wanted cultural and public

assets or entire neighbourhoods to be rebuilt. The methodologies used to glean citizens' opinions included semi-structured interviews, focus groups and questionnaires. Table 4.2 summarises the participatory activities carried out after the earthquakes in Emilia-Romagna.

Table 4.2: Participatory initiatives carried out in Emilia-Romagna after the earthquakes

NAME	MUNICIPALITY	AIMS	WEBSITE
Più sanFelice	San Felice sul Panaro	Establish good practices and critical situations	http://terremotosanfelice.org
Immagina Mirandola	Mirandola	Participatory urban planning	http://www.immaginamirandola.it
Ricostruire Finale	Finale Emilia	Sharing proposals on reconstruction	No website

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Fatti il centro tuo!	Novi di Modena	Community engagement in the reconstruction projects	http://www.comune.novi.mo.it/index.php/fatti-il-centro-tuo
1 2 3 Scuola!	Camposanto	Participatory projects for the reconstruction of the schools	http://www.comune.camposanto.mo.it
Less is More	Sant'Agostino	Sharing ideas on how to revitalize the city centre	http://www.comune.santagostino.fe.it/
Spazio ai Giovani	Cento	Participatory projects for the reconstruction of meeting points for young people	http://www.comune.cento.fe.
ILCommercio al centro.	Nonantola	Participatory projects to attract businesses in the city centre	http://www.comune.nonantola.mo.it
Dalla Calamità alla calamita	Concordia sulla Secchia	Revitalizing the city centre	No website

Punti di Convergenza	Mirabello	Participatory urban planning of the areas damaged	http://www.puntidiconvergenza.it
Creva.Azione	Crevalcore	Promotion of the economic activities of the historical city centre	http://www.crevaazione.it

4.2.4. Research context: previous communication trends in Italy and Emilia-Romagna

National statistics offer a good snapshot of the trends in communication between the Italian authorities and citizens. The knowledge of previous communication trends sheds light on whether post-disaster communication presents any peculiarities or can be seen as a continuation of previous dynamics. In the following discussion I will present the results from some statistics collected at the national level in 2011, 2012 and 2013, which provide information on the trends and on factors influencing the use of social media by Italian government officials and citizens.

With regards to the authorities, according to a study conducted by the University of Modena and Reggio Emilia in 2011 on the topic “municipalities 2.0”, the greatest part of Italian municipalities created profiles on Facebook, followed by YouTube, Google Maps, blogs and Twitter. Likewise, Italian politicians preferred using Facebook for political

communication followed by Twitter (Mosca 2012). Elected officials were more likely to use social media, with the mayors and councillors being the most active, followed by directors and executives (OPERA 2011). The size of the municipality also affected the extent to which it used social media to communicate with citizens, with the bigger municipalities being more active (OPERA 2011). In 2011 and 2012, Italian municipalities started to become more aware of the benefits deriving from the use of social media in terms of efficiency and effectiveness in the communication with citizens (OPERA 2011). Nevertheless, the investments on social media technology were still low and the use was limited to informational purposes (one way communication to provide useful information to the citizens). The research conducted by OPERA in 2011 revealed that more than half of Italian municipalities were not willing to make use of social media. The motivations for this refusal included: high costs for the implementation of these tools (54%), perceived lack of utility of this investment (30%), lack of personnel (21%), lack of competencies and professional figures (20%), and that project costs were too high (13%).

However some peculiarities of the Emilia context need to be highlighted. The Region of Emilia-Romagna is well known for boosting the active participation of its citizens. In 2008 the Region created an “Observatory of Participation”, whose goals were to make information more accessible and transparent and to create spaces of participation and engagement among all the stakeholders (Regione Emilia-Romagna website, no date (a)). In 2011 a new planning instrument was launched, namely (PITER - *Piano Telematico dell’Emilia-Romagna 2011-2014*), designed to improve the access to digital technologies across the region. The aims of the project included enabling access to information and communication technologies (ICTs) and to open data, and reducing the digital and knowledge divide (Regione Emilia-Romagna website, no date (b)). The Regional Council

also created an open-data web portal (<http://dati.emilia-romagna.it>) with information from regional, provincial and local councils. According to a study conducted in 2013, Emilia-Romagna Regional Council was very active in the use of social media, being present on Facebook, YouTube and Twitter (Pavan 2013). Concentrating on Modena, one of the provinces most affected by the earthquakes in 2012, it was noted that it had an account on Facebook, Twitter, YouTube and Flickr (source: <http://www.comune.modena.it>).

With regard to the Italian population, in 2012 78% of the population in Italy had a Facebook account but many people were only passive users. Hence, they rarely used their account in an active manner (GWI 2012). Among the other social networking sites used by Italian citizens in 2012, Google Plus counted for 36% of the population (but only 14% were active users) and Twitter counted for 27% of the population (GWI 2012). The factors identified as influencing the use of social media were manifold and could mainly be attributed to level of education, income and age with highly educated, wealthy and young people being more likely to use new media for political discussions. The level of engagement in political and social discussion was also a predictor of social media use. Indeed, 85% of the people who used the Internet for political purposes (identified as “cives.net”) connected to the Internet every day compared to 44% of the ones who did not use the Internet for this purpose.

The Demos & Pi survey (2013) gave a picture of the people most likely to use the Internet to discuss social and political issues. These people were named in the survey “cives.net” after the nouns “*cives*” which in Latin means “citizens” and “net” indicated a generic top-level domain in use especially among technology companies. The survey found that in Italy the “cives.net” were predominantly men, with a high level of education, with an age range of 15-54 (including peaks in the range 15-24 and 35-44), with

highly remunerated employments (e.g. manager) or in current education (student). The percentage of the cives.net dropped when people older than 54 years old, unemployed or with lower income (e.g. manual worker) and with low level of education were considered. The percentage of housewives in the cives.net was found very low. Vaccari et al. (2013) found similar results in a study of Twitter users during the 2013 elections in Italy. Additionally, Vaccari et al. (2013) noted that those who engage in political discussions on Twitter are also more likely to talk about politics off-line and be more interested in social and political issues in general.

Data show that the percentage of the cives.net (people that use social media for political discussions) increased from 25% to 29 % between 2010 and 2012 (Demos & Pi 2013). On the other hand, a study of the use of social media by the citizens in the district of Pesaro and Urbino showed that the 46% of the respondents were hardly interested at all in using social media to enter into discussions with political delegates in local institutions. Half of the respondents (50%) were interested in using social media to receive information from political delegates, whereas less than the half were interested in having bi-directional communication (Sigma Consulting 2012). In this last category, people were more frequently found to be in the age range 18-54, with a high level of education and residents in the bigger municipalities (Sigma consulting 2012). According to a survey conducted in 2012 by ISTAT, the Italian Institute of Statistics, the major obstacles to the use of the Internet by consumers were technical difficulties, such as lack of specific computer competences (32 %), lack of tools such as computers, Internet connection and broadband (31%), and lack of trust in the security of the procedure (14%). Lack of technical knowledge was higher in people between 50 and 64 years old, whereas lack of tools such as computers or broadband was higher in people over 65 years old. By contrast, lack of security of Internet procedures seemed to be a concern of the youngest users. The disparities persisted when

household income was surveyed. Families in which the head of the household was a manual worker were found to be less likely to have a personal computer or a broadband connection compared to the families of managers or the self-employed.

With specific reference to Emilia-Romagna region, statistics showed that the number of people who use the Internet every day grew considerably between 2008 and 2014 (Regione Emilia-Romagna website 2014). In 2013, 60% of the population in Emilia-Romagna made use of the Internet with peaks registered in the age ranges 16-24 (92%) and 25-44 (83%). The rate dropped significantly among people over 64 years old. Gender and education levels proved to be relevant predictors of Internet use with men and graduated being more active. From 2012 to 2014, the number of people that use the Internet to search for information on government agencies' websites (29%) and to download forms (23%) remained constant (<http://digitale.regione.emilia-romagna.it/dati/temi/uso-di-internet>)

4.3 Usage of new communication technologies during and after the Emilia-Romagna earthquakes

The L'Aquila earthquake has attracted massive attention from national and international academic and non-academic audiences (see as examples of studies on this disaster Alexander 2010, 2012; Ozerdem and Rufini 2013; Padovani 2010; Farinosi 2011; Liel et al. 2013). In comparison, the literature on the social aspects of the earthquake in Emilia-Romagna is more limited (i.e. Hajek 2013; Pattaro and Tripi 2013; Pescaroli et al. 2012).

As for many other disasters, during the Emilia-Romagna earthquake new media played a crucial role in disseminating information, informing relatives and friends about a person's safety and whereabouts during the emergency and collecting donations and other forms of aid in its wake

(Redattore Sociale 2012). The survey conducted by Pescaroli et al. (2012) on information-seeking behaviours immediately after the tremors of the 20th May revealed that the greatest number of participants (22.7%) sought information about possible aftershocks on the Internet (including social networking sites and on-line newspapers). After some days, the website couchsurfing.com, which was created to connect travellers with a global network of people willing to host them, started to collect requests for hospitality by the people rendered homeless and offers of hospitality by those willing to open their houses (*Il Messaggero* 2012). In emergency situations, on-line networks can self-organize and distribute aid and goods in a very short time. Nevertheless, disaster management agencies, in particular civil protection ones, have not been able to incorporate these grassroots efforts into their response operations (Redattore sociale 2012). For the first time in the history of Italian disasters, only a few days after the first tremors scientists at the Institute of Geophysics and Volcanology (INGV) made use of an on-line form to glean information about the geological effects of the earthquake from ordinary citizens. The data coming from these “social sensors” were then integrated with those collected from physical sensors (Alessio et al. 2012). Immediately after a disaster crowdsourced data have proved to be crucial to obtain real time information and rapidly identify damaged areas and vulnerable people. In this respect, in April 2012, the British Geological Survey and the UK Meteorological Office submitted a challenge, asking participants to verify whether information from social media might be harvested and visualized on a map in such way that it could provide the authorities with a better overview of the earthquake’s effects. A month later, during the Emilia-Romagna earthquake, the hazard mapping team had the chance to test the “heat map approach”, which allows one to produce graphical representations of the density of data within geographic space. The heat map showed that the main points of tweeting activity were focused near

the epicentre and within the urban centres, proving that the analysis of social media activity is a good means of identifying the most affected areas (Bee et al. 2012).

Despite these achievements, some negative aspects of social media use should be highlighted. The Web can be also used to disseminate misleading information or to exploit the disaster for the sake of profit. The case of *Groupalia* (the Italian equivalent of Groupon, a website that promotes discounted coupons for travel and food) became a scandal when the following message appeared on the company's Twitter account: “*Pauro del #terremoto? Molliamo tutto e scappiamo a #Santo#Domingo!*” (in English: “Scared by the earthquake? Let's quit everything and go to Santo Domingo!”), promoting a coupon to travel to the Caribbean island (tg24.sky 2012).

Several innovations geared toward making the recovery faster and more effective through the use of information and communication technologies (ICTs) are worth mentioning. The assessment of damage and the procedure for making certificates of usability have been expedited by using a smartphone application that acquires citizens' requests and assesses the state of damage to buildings. The application provides a function to attach photos and sketches of the building and send them to the operations centre for evaluation (Arcidiacono and Cimellaro 2013). Additionally, an on-line platform was created, through the use of the MUDE (*Modulo Unico Digitale Edilizia*, a unique digital form for the building sector), which allowed local governments and technicians to monitor the administrative and financial procedures of the reconstruction process (Pattaro and Tripi 2013). The request and allocation of funds for works on public and cultural assets has been facilitated by the FENICE web platform. As in the case of public works, the web platform named SFINGE (*Sphynx*) supported the processing of funding requests by local industries. The municipality of Modena has been involved in two other projects that aim to experiment

with innovative solutions to disaster recovery. For example, the SECURE project focused on the search for innovative solutions to disaster recovery through the use of integrated and redundant networks and interoperable data centres and interfaces. The second project, named "PICO - Cultural Heritage", proposed innovative solutions to the recording preservation and recovery of cultural heritage (Pattaro and Tripi, 2013).

Other on-line platforms have had the specific aim of making the reconstruction more transparent. For example, OpenRicostruzione was designed so that citizens could track the use of the donations made for the reconstruction and illustrate the progress of the projects funded (see: www.openricostruzione.it).

4.4. Specific research goals, research instruments and data collection methods

Research goals and instruments and data collection methods for this research mirrored, in large measure, the ones described in Chapter 3. A mixture of data collection methods was used to investigate communications by authorities and citizens in the chosen case study, including field notes, structured questionnaires and observation of governmental websites and social media profiles. In addition, some demographic and organisational data were harvested at the end of the questionnaire. By doing so, it was possible to profile the information senders and their communication habits. In the question on the target(s) of communication of the citizens' questionnaire, the government agencies at local, provincial and regional levels were listed, along with emergency services (e.g. police and fire services and the civil protection authorities). The respondent was allowed to add another option in the "Other (please specify)" section.

In April 2014, I conducted a field trip to meet with local mayors and representatives of community-based groups and to start administering the questionnaires. Talking with the mayors is relevant as, in the Italian Civil Protection system, the mayor is the primary civil protection authority in his or her municipality. Furthermore, as sub-commissioners for the reconstruction, mayors played a primary role in the rebuilding process. After this, different data collection methods were used for authorities and citizens. As for the authorities, other relevant stakeholders were contacted via emails that asked them to fill in the on-line form. As for the citizens, the questionnaire was distributed through earthquake-related groups and associations that took on some recovery tasks. It could be filed either on-line or by hand, and it was self-completed by the respondents. Two community organisations helped me to deliver the hard copy of the questionnaire to the population. However, the majority of the responses came from only one of these associations. Therefore it is reasonable to assume that the people recruited to answer the paper survey came from a homogeneous geographical area. Respondents to the surveys were invited to focus on the period that started three months after the earthquakes. Although the Institutional Committee for the Reconstruction was already established one month after the earthquake (in June 2012), two more months had to pass before, in August 2012, the national civil protection authorities handed over the management of the recovery to the special commissioners and sub-commissioners.

In order to broaden the data collected via multiple-choice questionnaires, a structured observation of the government agencies' web-portals and social media accounts was performed. The municipalities that were undergoing a reconstruction process were identified through the list provided by the OpenRicostruzione website, which included 42 municipalities located in four different provinces (Modena, Bologna, Reggio Emilia and Ferrara). Although the earthquake also hit other northern Italian regions, such as

Veneto and Lombardy, the most severe damage was concentrated in Emilia-Romagna and therefore the investigation was limited to this region. The social media profiles of the municipalities and provincial and regional councils were monitored over a period of six months (from August 2014 to February 2015) to verify the frequency of use and the presence of a two-way dialogue.

4.5. Analysis of the results

4.5.1. Observations during the field trip in Emilia-Romagna and collection of data

Town councils have a primary role in communicating information about the reconstruction to citizens. The mayor of the first municipality visited confirmed that different offices within the town council dealt with various aspects of the reconstruction (e.g. assign temporary accommodation, rebuild public assets, assist the population etc.). The work of the town council proceeded in cooperation with other authorities at provincial and regional level. With regards to social media use, these tools have been primarily employed in the response phase and less in the recovery phase, as the authorities lacked policies and guidelines about how to communicate during reconstruction. I also had the opportunity to attend one of the meetings between the mayors of some of the municipalities affected, the national association of Italian municipalities (ANCI - *Associazione Nazionale Comuni Italiani*) and the organisation called “Libera” which is at the front line in preventing criminal influences in the reconstruction process in Emilia. Libera is also the coordinating agency of the “Observatory on the Reconstruction”.

During the course of the meeting, mayors raised some crucial points, including the following. First, there was a lack of information about what

mayors should expect from a reconstruction process, such as how long it normally takes. There was also a lack of guidelines and rules to define best practices. Secondly, as a result of the national civil protection authority's re-organisation of tasks and activities established by Law no. 100/2012, there was no clear regulatory framework to support the reconstruction after the disaster. They also complained that the actual reconstruction started after February 2013, when the Government approved a new decree that increased the potential refund for reconstruction of real estate from 80% to 100% of the total costs. Thirdly, there was a shortage of personnel assigned to complete the paperwork for the reconstruction. Finally, the rules were applied in ways that differed between municipalities and regions. This variability was due to the flexibility allowed by the decrees approved by the Emilia-Romagna Regional Council, and by the other Regions involved, and to the different characteristics and needs of each municipality.

Overall, the mayors complained about the general lack of a reference framework with rules, policies and guidelines designed to help them lead the reconstruction of their towns. The lack of a reference framework made communicating with citizens very difficult, as government officers were more likely to provide inaccurate and misleading information. This was particularly true for the communication that took place via social media. As expressed by one of the mayor interviewed, these are a “public showcase, where everything you say is visible publicly and everyone can comment on it”. While this mayor used his or her personal Facebook account to inform the citizens and respond to queries in the first weeks after the earthquake, this activity was extremely time consuming and exposed that person to extremely offensive comments. In the opinion of this mayor, the reconstruction process triggered strong negative emotions and feelings among people, making social media an unsuitable tool to discuss matters with citizens, as everything written remained on the web.

The other municipalities visited adopted various channels to provide information on the reconstruction. One of these used predominantly face-to-face interactions and printed materials (posters, newspapers) because, as stated by the public relations officer, “here everybody knows each other and sometimes people ask me for information on the reconstruction when we meet casually on the street” (personal communication). Also the demographic characteristics of that municipality, predominantly older people who are unfamiliar with the use of new technologies, made these channels the most suitable ones. The importance of printed materials in government-to-citizens (G2C) communications about the reconstruction is confirmed by photographic evidence (Figure 4.7) and by the press officers of the last city council visited.

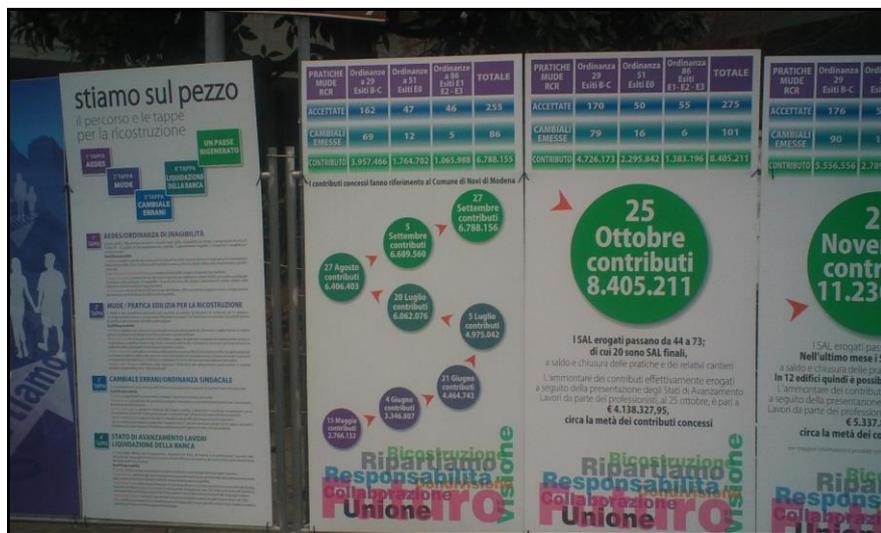


Figure 4.7. Posters in Cavezzo (MO). Some posters give information on the reconstruction process in an affected municipality. The title of the first poster on the left says: “We are on top of it: the path and steps for reconstruction”. Photo taken during the field trip in April 2014.

Along with providing information via social media and website, the press office of this town council also publishes a monthly magazine, called

“L’Indicatore Mirandolese” on the latest news from the municipality (and surrounding areas), including information related to the reconstruction (Figure 4.8). This newsletter is available on-line and has a Facebook page (Figure 4.9). The meeting with the core committee of two grass-root associations working on earthquake and recovery-related themes shed light on the importance of these groups as intermediaries in the communication that takes place between residents and government agencies around the recovery process.



Figure 4.8. Picture of the newspaper “L’indicatore Mirandolese” produced by the Mirandola city council. The title says “A thousand controls on the reconstruction”. The article provides details on the surveys made by the municipal police in the temporary shelters



Figure 4.9: The Facebook page of the Indicatore Mirandolese. It informs of a public meeting between government officials and citizens to discuss the reconstruction progress.

These groups played a key role during the reconstruction process in terms of: (a) amplifying the information coming from official sources such as government agencies and broadcasting media; (b) being a place where one could openly ask questions about reconstruction and share ideas with people in similar condition; (c) collecting residents' opinions on key reconstruction issues and presenting these views in meetings with government officers; and (d) clarifying to residents official information and legal acts issued for the reconstruction. Evidence collected on the Facebook pages of some community-based associations and on-line groups confirmed these insights. Figure 4.10 presents a post from a member of the committee "Sisma.12". It shows that the group has provided information and clarification to the residents about the bureaucratic procedures that had to be followed to rebuild their houses. After the field trip, these associations were asked to distribute printed copies of the questionnaire to their followers. Meanwhile the link to the on-line version was published on earthquake-related Facebook groups and pages.

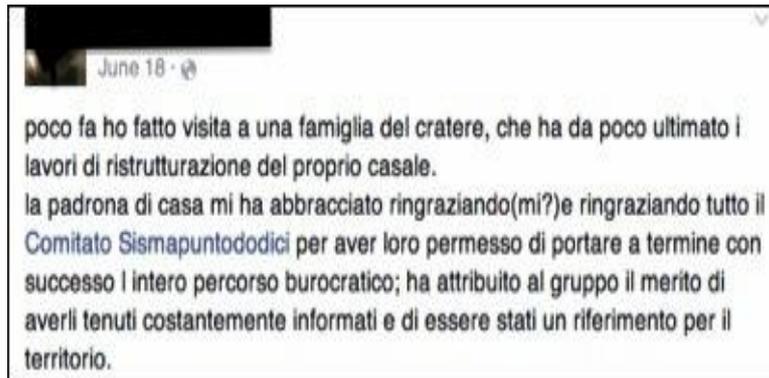


Figure 4.10. A Facebook post from a member of the committee “Sisma.12”. The post says: “A few moments ago I visited a family in an earthquake-affected area which has recently completed the repair works on its property. The homeowner hugged me, thanking Sisma.12 Committee for enabling them to complete successfully the bureaucratic procedures by keeping them constantly informed and by being a point of reference for all the affected area”.

4.5.2. Communications and social media usage by government agencies in the reconstruction phase following the Emilia-Romagna earthquake

Questionnaire results

Fifty-six (N = 56) government officials responded to the questionnaire. Respondents’ demographic data are summarized in Table 4.3. Along with descriptive analysis, each of the questions or statements was tested, either to explore the relationships with the demographic characteristics of the respondents (i.e. age, gender, working role, size of the city), or to compare the groups with these characteristics. More specifically, the analysis was designed to identify patterns among social media users¹.

¹ Inferential statistics allow one to test hypotheses and make statistical predictions about a population based on a sub-set (a sample) of the population. In order to identify differences in

Table 4.3. Demographic profile of survey's respondents

Gender	Males (66%)	Females (34%)		
Age	<i>Mean</i> 44.1±9.94			
Occupation	Elected officers (49%)	Civil servants (22%)	High level officer (18%)	PR personnel (12%)
Institution	Municipality (91%)	Province/Region (9%)		
Size of Municipality people work in	<10,000 inhabitants (45%)	10,000 to 30,000 inhabitants (23%)	>30,000 inhabitants (32%)	

All the officers responded to the question regarding the typology of information they provided to citizens during the reconstruction phase. The most common information provided included that on housing and infrastructure reconstruction (52%), followed by funds or refunds (39%) and use of donations (30%) whilst most under-represented were

communication and social media usage patterns between sample's groups, I performed chi-square and Kruskal Wallis tests (non-parametric tests), assuming that variables were not normally distributed. As a post-hoc test, a Mann-Whitney U test was used to perform a paired comparison between groups and test the validity of statistical hypotheses. As multiple hypotheses were tested, Bonferroni corrections (α/μ where $\alpha=0.05$ and $\mu=$ number of hypothesis) was applied to compensate for potential statistical biases.

environmental risks (1%), waste management (3%), and information regarding citizens' committees (3%), as described in Figure 4.11

Based on the odds ratio, females were about five times more likely to provide information on psychosocial support services than males, $\chi^2(1)=3.87$ (Yates continuity correction), $p<0.05$, $\phi=.31$; while respondents from large municipalities were respectively 3.7 and 7 times more likely to provide information on traffic and public transportation compared to those from medium-size and small municipalities, $\chi^2(1)=5.98$, $p<0.05$, Cramer's $V=.33$. High-level officers were 9.2, 8 and 1.6 times more likely to provide information on damage assessment with respect to elected officers, civil servants and public relations personnel.

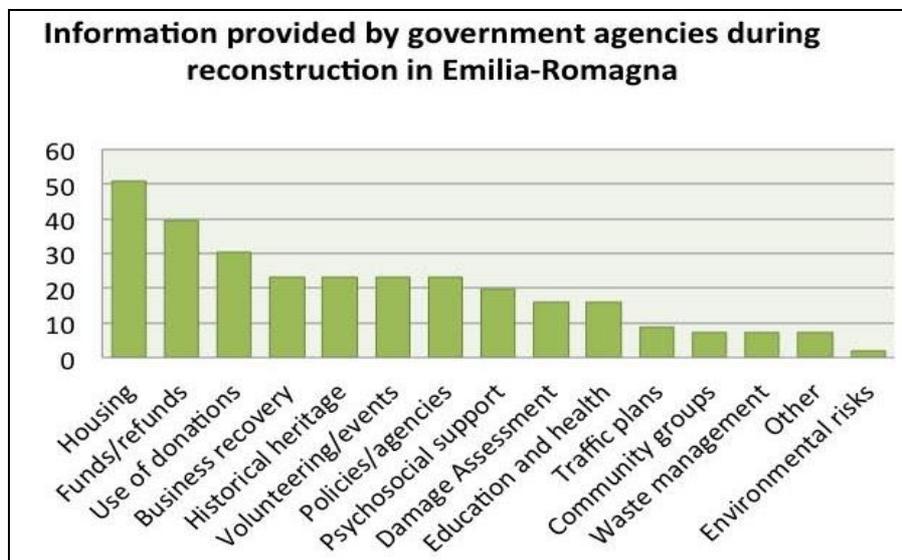


Figure 4.11 Information provided by government agencies

Officers responded also to a multiple-choice question asking to which social groups they had addressed information. Information was largely addressed to all citizens, although business people, homeowners, and members of community-based groups were also targeted. The most

underserved social groups turned out to be teenagers, immigrants and the elderly. The results are shown in the following pie charts (Figure 4.12).

Respondents over 50 years old were 3.2 and 4.4 times more likely to consider both elderly and immigrants when addressing the information compared to those between 40 and 49 and up to 39 years old respectively $\chi^2(1)=6.69, p<0.05$, Cramer's $V=.35$.

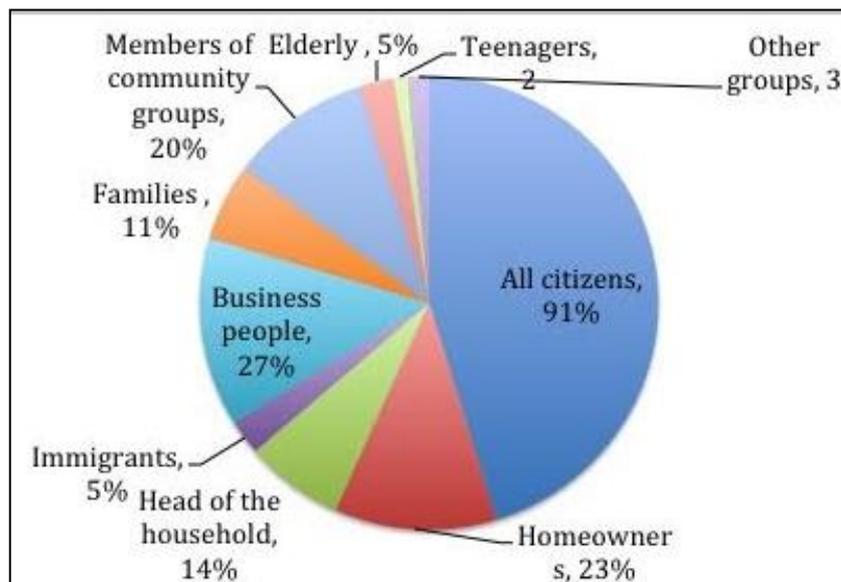


Figure 4.12. Targets of the communications by government agencies

With regards to the type of communication channels used to provide this information, Figure 4.13 shows how frequently the respondents used each communication channel. As evidenced, face-to-face meetings and the Internet (websites and emails) were by far the most widely adopted channels for the provision of information about the reconstruction.

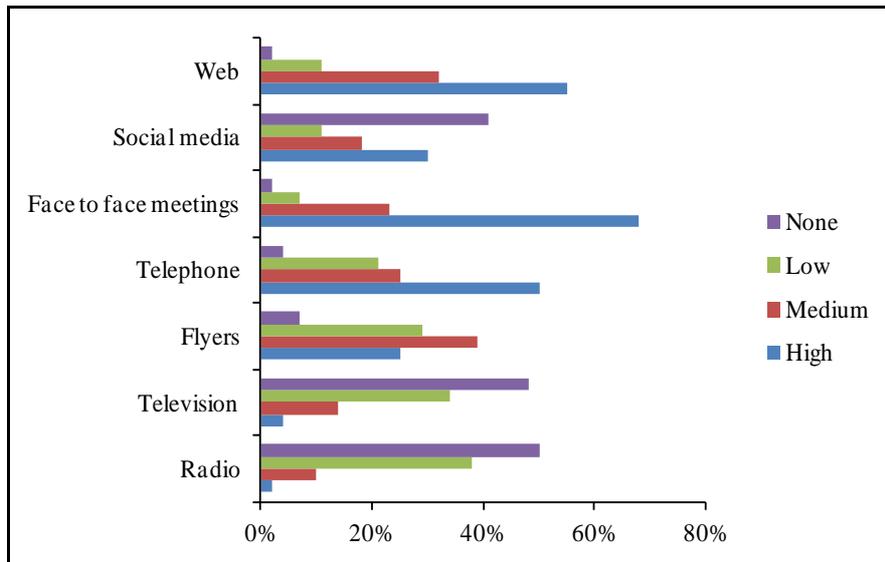


Figure 4.13. Frequencies of media usage

Less than half of the respondents used social media with medium to high frequency. Furthermore, a subsequent question revealed that only 39% of them used these social media sites to communicate bi-directionally with citizens, thus highlighting that these tools serve mainly for information provision rather than for building dialogue. Those who used social media to institute two-way communication with citizens mostly adopted Facebook as the medium of reference (83%), and 17% indicated websites dedicated to the reconstruction.

Females ($Mdn=3$) used the telephone more frequently than males ($Mdn=2$), $U=935.5$, $p<0.05$, $r=-.30$. Instead, public relations officers ($Mdn=3$) and elected officers ($Mdn=3$) were those who most frequently utilized social media (SM) to spread information, $H(3)=20.43$, $p<0.001$. A Mann-Whitney U Test with Bonferroni correction ($\alpha=0.0125$), performed in order to follow up this finding, confirmed the difference in SM utilization frequency between elected officers ($Mdn=3$) and high level officers ($Mdn=1$), ($U=38.5$, $r=-.52$) and civil servants ($Mdn=1$), ($U=34$, $r=-.62$), or between public relations personnel ($Mdn=3$) and civil servants ($Mdn=1$)

($U=8$, $r=-.69$). Conversely, public relations personnel ($Mdn=1$) were those who less frequently met the public face-to-face to spread information. A Mann-Whitney U Test with Bonferroni correction ($\alpha=0.17$), performed as a follow-up to this finding, confirmed the difference in face-to-face meetings between public relations personnel ($Mdn=1$) and elected officers ($Mdn=3$) ($U=24.5$, $r=-.54$) or between public relations personnel ($Mdn=1$) and high-level officers ($Mdn=3$) ($U=4.5$, $r=-.82$).

Next, respondents were asked about the motivations and barriers to the use of social media during the reconstruction period. In line with the multiple response rate, the vast majority of them (81%) used social media sites to post information about public events on reconstruction and respond to citizens' complaints and questions about reconstruction (55%). Public relations personnel were 8, 4 and 1.7 times more likely to having used social media during reconstruction in order to post information about public events with respect to civil servants, high level officers, and elected officers respectively ($\chi^2 (3)=10.28$, $p<0.05$, Cramer's $V=0.60$). Elected officers were found to be 1.5, 5.3 and 16.5 times more likely to use social media for bidirectional purposes likened to public relations personnel, high level officers, and civil servants respectively ($\chi^2 (3)=13.01$, $p<0.01$, Cramer's $V=0.51$). Respondents reported as barriers to the use of social media the lack of guidelines (26%) and the lack of personnel to employ in social media communication (17%). Other barriers mentioned included the following: social media were not considered as a top priority (14%) or useful to communicate with citizens (12%), and institutions forbid the use of SM during working time (12%). Respondents up to 39 years old were 4.7 and 5 times more likely to not have used social media during reconstruction because of their concern about data security between 40 and 49 and over 50 years old respectively ($\chi^2 (1)=8.17$, $p<0.05$, Cramer's $V=0.40$). In addition, public relations personnel were 11, 10 and 9 times more likely to not have used social media during reconstruction because of

data security concerns compared to elected officers, civil servants, and high level officers respectively ($\chi^2(3)=7.9$, $p<0.05$, Cramer's $V=0.41$). Civil servants were 2.3, 4.6 and 13 times more likely to not have used SM during reconstruction because it was not a top priority compared to public relations personnel, high level officers, and elected officers respectively ($\chi^2(3)=7.84$, $p<0.05$, Cramer's $V=0.40$). They also resulted 1.5, 3.6 and 29 times more likely to not have used social media during reconstruction because of the lack of guidelines compared to high level officers, public relations personnel, and elected officers respectively ($\chi^2(3)=15.74$, $p<0.005$, Cramer's $V=0.57$).

Lastly, on a five-point Likert scale, respondents answered statements about attitudes toward the use of social media during the reconstruction phase. The results are reported in Figure 4.14.

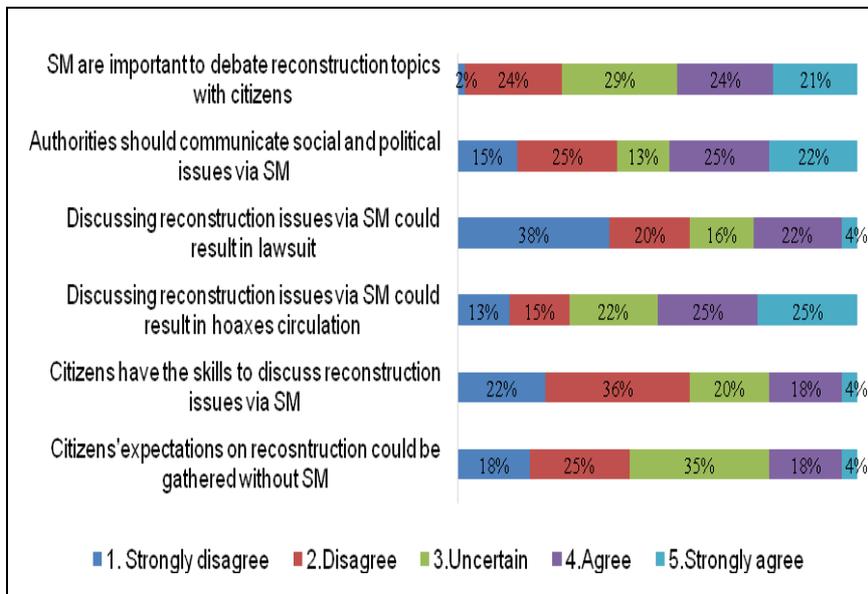


Figure 4.14. Attitudes toward the use of social media during the reconstruction period by government officers

Results from structured observation of official websites and social media profiles

In order to broaden the data collected via multiple-choice questionnaires, structured observation was performed on the government agencies' web-portals and social media accounts. In particular, I investigated whether government agencies had a dedicated section within their web-portals (or as a separate web page) in order to provide information about the reconstruction. I also asked whether social media accounts were used for this purpose within a specific time frame. The analysis indicated that 25 out of the 43 town councils' web-portals analysed had a dedicated section. The same was true for two out of the four provincial offices' web-portals. The Emilia-Romagna Regional Council's website had a broad section called "*Dopo il terremoto*" (In English: "After the earthquake") (Figure 4.15) which provided up-to-date information and a list of all decrees issued to manage the reconstruction. This confirmed the importance of the Internet and especially of the official websites in communicating information to the public during PDR.



Figure 4.15. The section within the Emilia-Romagna Regional Council's website dedicated to provide information about the reconstruction.

Chapter 4. Research on Communications and Social Media Usage in the Post-Disaster Phase: the Emilia-Romagna Earthquake Case Study

Three town councils and one provincial council decided to create web-pages (usually in form of a blog) that were separate from the main web-portals. They included: Medolla Town Council (<http://www.ricostruiamomedolla.it>), San Felice sul Panaro Town Council (<http://terremotosanfelice.org>) (Figure 4.16), Ferrara City Council (<https://terremotoferrara.wordpress.com>) (Figure 4.17) and Bologna Provincial Council.



Figure 4.16. Homepage of the blog “We want to start anew” run by the San Felice Town Council



Figure 4.17. Homepage of the blog “Let’s defeat the earthquake” run by Ferrara City Council. The blog has now a new address (<https://prevenzionesismica.wordpress.com>) and it has been integrated into a larger project on seismic risk prevention.

Twenty town councils out of forty-three had an account on one social media at least. Of these, 19 (95%) had a Facebook account, eight (40%) had a Twitter account, three (15%) had a YouTube channel. Two provincial councils out of four had an account on Facebook, Twitter and YouTube. The Emilia-Romagna Regional Council was active on Facebook, Twitter, YouTube and LinkedIn. In almost all the cases, the social media profiles were updated daily or every few days. These profiles were monitored from August 2014 to February 2015 to verify the frequency of use for the provision of information related to the reconstruction and the presence of a two dialogue. During the analysed timeframe, 12 Town Councils (60%), one Provincial Council (50%) and the Emilia-Romagna Regional Council were found to have provided updates about the reconstruction via social media at least once. However it should be noted that, over the period mentioned, three of these agencies posted fewer than two updates, four posted between two and five updates, and four provided between five and ten updates. Only the Emilia-Romagna Regional Council posted more than ten updates both on Facebook and Twitter. Looking at the type of information posted, it encompassed information about decrees, funds or refunds (Figure 4.18), use of funds and donations, events related to the reconstruction (Figure 4.19) and progress achieved.



Figure 4.18. The Novi di Modena City Council Facebook page. It informs about the grants given to those who found an autonomous accommodation. *“Grants for autonomous accommodation: The payment for the period August-September 2014 included 2 months of*

payments for the dwellings in any class of the damage ranking and it amounts to 756.679,03 euros for a total of given funds of €14.625.194,88 since May 2012



Figure 4.19. The Finale Emilia Town Council's Twitter profile. It provides the link to the show on the cultural assets affected by the earthquake in Emilia-Romagna. “*Terreferme: in Bologna the multimedia exhibition on the cultural assets affected by the earthquake.*”

Social media profiles have also often been used to invite citizens to participate in public meetings with recovery agencies to discuss the progress and achievements of the reconstruction process (Figure. 4.20)



Figure 4.20. Facebook page of the San Felice sul Panaro Town Council. The text says “*The council administration meets citizens, business owners and the committee for the economy and work to present the state of the reconstruction on February 2015 and the budget plan 2015. Thursday 26 February at 9 p.m.*”

There was little to no evidence that two-way dialogue occurred between government agencies and citizens on the social media platforms analysed.

On the contrary, the largest part of the posts had no comments appended. In the very few cases in which this happened, the comments were criticisms of the decisions taken and the time length and procedures of the reconstruction process.

4.5.3. Communications and social media usage by citizens in the reconstruction phase following the Emilia-Romagna earthquake

A separate analysis was performed on the responses obtained from the on-line questionnaire and on those obtained from the questionnaire distributed in person by the community groups.

Socio-demographic characteristics of the respondents

Two hundred and six people responded to the on-line questionnaire. Of these responses, 177 were considered valid, as each person stated that he or she resides in an area under reconstruction and does not work for a government agency. The majority of the respondents were females (62%) holding a high school diploma (63%) and living in municipalities with fewer than 20,000 inhabitants (75%). This partially reflects the composition of the municipalities affected by the earthquake, as 83% have fewer than 20,000 residents. The age range of the respondents spanned 19 to 70 years ($M=44$, $SD\pm 11.13$). Some 25% of the respondents declared that they held a degree and 12% a secondary school diploma. Some 91% were social media users, while only 9% declared that they do not use social media. With regards to the type of employment, 42% of the respondents were civil servants, 28% were self-employed, 8% were manual labourers 8% unemployed, 6% students, 5% were retired and 3% were housekeepers. Two community organisations helped me delivering the hard copy of the questionnaire to the population. However, the majority of the responses

came from only one of these associations. One hundred and eight surveys were received in completed form, only three of which were from people who were not present in the area at the moment the earthquake struck. In this case, the percentage of males and females respondents was balanced (51% men and 49% women). The respondents had ages spanning 18 to 77 years ($M=44.7$; $SD\pm 14.38$). Some 38% were civil servants, 20% were self-employed, 13% retired, 10% manual labourers, 8% housekeepers, 6% students, and 5% unemployed. With regards to the level of education, 63% held a high school diploma, 18% a secondary school diploma, 12% a primary school diploma, and only 7% had a degree. Some 89% of the respondents came from municipalities with less than 20,000 inhabitants. This is probably due to the fact that respondents came from a homogeneous geographical area. In all, 68% used social media while 32% did not.

Table 4.4 Comparison of the socio-demographic characteristics of the respondents to the on-line and paper questionnaires.

	Online survey	Paper survey
N. respondents (valid)	177	108
Gender	62% women; 38% men	48% women 51% men
Age (M and SD)	$M=43.9$; $SD\pm 11.13$	$M=44.7$; $SD\pm 14.38$
Level of education	High school diploma (63%)	High school diploma (64%)
Size of the city	75% live in a town with less than 20,000 residents	89% live in a town with less than 20,000 residents
Employment	42% civil servants	38% civil servants
Social Media User	91%	68%

While the general socio-demographic characteristics of the respondents were similar and comparable, it should be noted that the respondents to the paper version were generally older, had a lower level of education and

were more likely to be employed in low-skilled jobs and less likely to use social media. This confirms the well-known 'digital divide' where wealthier and better-educated people with high socio-economic status are more likely to be involved in social media and on-line groups.

Communication practices during the reconstruction process

In the first part of the survey, I asked about the type of information that people had sought from the authorities during the reconstruction phase, the authorities from which this information was sought and the communication channels used. Table 4.5 summarises the responses for both the on-line and paper questionnaire regarding the most sought-after information during the PDR, and it summarises the main information sources. With regard to the on-line questionnaire, other information sought included: educational and health services (15%), new recovery policies and agencies (17%); use of donations (16%), traffic plans and public transportation (15%), preservation of the historical heritage (15%), volunteering and events related to the reconstruction (11%).

Table 4.5. Type of information sought and source of information (first four most ticked items)

	On-line survey	Paper survey
Type of information sought	Housing and infrastructure reconstruction (61%)	Housing and infrastructure reconstruction (75%)
	Funds/refunds (40%)	Business and industries recovery (57%)
	Business and industries recovery (33%)	Funds/refunds (39%)
	Damage assessment (32%)	Damage assessment (17.%)
Source of information	Town Council (91%)	Town council (98%)
	Regional Council (29%)	Regional council (20%)
	Civil protection departments (27%)	Fire Departments (13%)
	Fire department (24%)	Civil Protection Departments (12%)

The least sought information related to environmental risks (10%), debris management (7%), psychosocial support (6%), and citizens' committees and associations (7%). Based on the odds ratio, females were more likely than males to seek information on business and industries recovery, $\chi^2(1)=3.76$ (Yates continuity correction), $p<0.05$, $\phi=0.14$, and on committees and associations, $\chi^2(1)=4.44$ (Yates continuity correction), $p<0.05$, $\phi=0.17$. In addition, graduate respondents were more likely than the others to look for information on the preservation of historical heritage, $\chi^2(3)=5.73$, $p<0.05$, Cramer's $V=0.15$. Although the large majority of the respondents (91%) sought this information from local government agencies, 5% of the people mentioned that they looked for information from community groups.

With regards to the paper questionnaire, other information sought included: historical heritage preservation (16%), volunteering and events related to the reconstruction (11%), traffic plans and public transportation (9%) and environmental risks (9%). The least sought information included debris management, community groups and associations, recovery policies and agencies and use of donations. No one admitted to have looked for information on psychosocial recovery. Few people mentioned provincial councils and police departments as sources of information about the reconstruction. Nine respondents (8%) admitted to have looked for information from community associations.

At the end of the first part of the survey, respondents were asked to state the frequency with which they had used specific channels to look for the information selected in question 1 on a scale from 0 to 3 (0—never; 1—rarely; 2—fairly often; 3—very often). For this question, on-line and off-line datasets were analyzed separately. As shown in Table 4.6, the results demonstrated a sharp difference between on-line and off-line responses with respect to the media used to obtain information during the

reconstruction process. Telephone, television and radio emerged as the least used channels.

For the on-line questionnaire, a Mann–Whitney U test with Bonferroni correction ($\alpha = 0.025$) showed that people who graduated from university (Mdn = 3) used the Internet more frequently than those with a secondary school diploma (Mdn = 2), $U = 512$, $p < 0.025$, $r = -0.11$.

Table 4.6. Comparison of the communication channels used to search for information on the reconstruction by on-line and off-line respondents. “Very often” and “fairly often” response rates were combined.

	On-line survey	Paper Survey
Communication channels	81% Internet	85% Face to face interactions
	66% Social media	70% Printed material
	59% Face to face interactions	57% Internet
	50% Paper material	40% Social media
	36 % Television	31 % Television
	35 % Phone	29 % Phone
	31 % Radio	18 % Radio

In addition, a Mann–Whitney U test indicated that females (Mdn = 2) used telephones more frequently than males (Mdn = 1), $U = 4060$, $p < 0.05$, $r = -0.15$. Female (Mdn = 1) also used TV more frequently than male (Mdn = 0), $U = 3764$, $p < 0.01$, $r = -0.2$.

For the paper survey, Kruskal–Wallis tests indicated that the use of a particular means of communication was significantly influenced by education level and age of respondents. Mann-Whitney tests (with Bonferroni correction, $\alpha = 0.008$) were performed to follow up this finding and interrogate differences among each category of education and age. Tables 4.7 and 4.8 show results of the Kruskal–Wallis test (second column), median utilization frequency of communication channels for each

category of age and education (third column) and results of Mann–Whitney tests with Bonferroni correction (significance level $\alpha = 0.008$) (fourth column). In the fourth column, where present, letters indicate the category (or categories) from which the specific category significantly differs ($p < 0.05$).

Table 4.7. Differences in communication means used to seek recovery information according to age

Channels	Kruskal-Wallis	Age (<i>Mdn</i>)	Mann-Whitney (Bonferroni $\alpha=0.008$)
Internet	$H(3)=38.65^{**}$	A. 18-34 (2)	D
		B. 35-44 (2)	D
		C. 45-54 (2)	D
		D. 55+ (1)	A-B-C
Social	$H(3)=30.08^{**}$	A. 18-34 (2)	D
		B. 35-44 (2)	D
		C. 45-54 (2)	D
		D. 55+ (0)	A-B-C
Face2face	$H(3)=10.78^*$	A. 18-34 (2)	
		B. 35-44 (2)	
		C. 45-54 (2)	
		D. 55+ (2)	
Telephone	$H(3)=9.68^*$	A. 18-34 (1)	D
		B. 35-45 (1)	D
		C. 45-55 (1)	
		D. 55+ (2)	A-B
Printed	$H(3)=14.50^{**}$	A. 18-34 (1)	D
		B. 35-45 (1)	D
		C. 45-55 (1)	
		D. 55+ (2)	A-B
Television	$H(3)=6.64$	A. 18-34 (1)	
		B. 35-46 (1)	
		C. 45-56 (1)	
		D. 55+ (2)	
Radio	$H(3)=2.06$	A. 18-34 (1)	
		B. 35-46 (1)	

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C. 45-56 (1)

D. 55+ (1)

Table 4.8. Differences in communication means used to seek recovery information according to level of education

Channels	Kruskal-Wallis	Education (<i>Mdn</i>)	Mann-Whitney (Bonferro ni $\alpha=0.008$)
Internet	$H(3)=52.34^{**}$	A. Primary (0)	C-D
		B. Secondary (1)	C-D
		C. High School (2)	A-B
		D. University (3)	A-B
Social	$H(3)=36.77^{**}$	A. Primary (0)	C-D
		B. Secondary (1)	C-D
		C. High School (2)	A-B
		D. University (2)	A-B
Face2 face	$H(3)=15.75^{**}$	A. Primary (3)	C-D
		B. Secondary (2)	
		C. High School (2)	A
		D. University (2)	A
Telephone	$H(3)=17.97^{**}$	A. Primary (2)	C-D
		B. Secondary (2)	
		C. High School (1)	A
		D. University (1)	A
Printed	$H(3)=6.15$	A. Primary (2)	C-D
		B. Secondary (2)	
		C. High School (1)	
		D. University (1)	
Television	$H(3)=15.07^{**}$	A. Primary (2)	C-D
		B. Secondary (1)	
		C. High School (1)	A
		D. University (1)	A
Radio	$H(3)=0.76$	A. Primary (1)	
		B. Secondary (1)	
		C. High School (0)	
		D. University (2)	

Dynamics of the social media-supported communication with authorities

In the second part of the survey, I wanted to investigate the dynamics of the social media-supported communications.

Responses to the question on the motivations for using social media during the post-disaster reconstruction were analysed separately for the on-line and off-line datasets because there may be potential differences in Internet usage between the two samples. Results revealed that people used this tool mainly to read and post information and queries on recovery-related issues. This held true in both the on-line and off-line datasets. Table 4.9 summarises the responses and compares the two datasets.

In general, similar usage patterns were shown in the paper and on-line surveys. However, on-line respondents seemed slightly more inclined to use social media for peer-to-peer interaction, whereas off-line respondents were more willing to collaborate with the authorities by means of social media.

Combining the results of the two datasets, a Chi Square test for independence indicated a significant associations between education level and posting queries on recovery-related issues, $\chi^2 (3)=12.39$, $p<0.005$, Cramer's $V=.25$

Respondents holding a secondary school diploma who were graduates from high school were more likely to use social media in order to post queries on recovery-related issues than were people who held a university degree. Females were two times more likely to promote off-line activities and protests than were men, $\chi^2 (1)=3.95$, $p<0.005$, $\Phi=.13$

Table 4.9. Motivations for using social media in the post-disaster reconstruction phase

I used social media during the reconstruction process:	Online	Paper
To read information about the reconstruction	74%	85%
To post information and queries	32%	44%
To promote activities and protests with other residents	18%	11%
To contact a government officer	14%	18%
To collaborate with authorities in the resolution of a recovery-related problem	4%	10%
I did not use social media for purposes related with the reconstruction	9%	3%
I used social media for other purposes during the reconstruction	3%	0%

Although the questionnaire was tested during the field trip and prior to its distribution, confusion arose regarding the question on the barriers to the use of social media to communicate with the authorities, resulting in the question being answered mainly by those who did not use social media. Making this question mandatory partially compensated for the on-line responses which could not be done for the paper survey. Eventually a total of 130 people answered this question in the on-line survey (with 47 missing responses) and 57 people (with 51 missing responses) answered the paper survey. In order to isolate potential biases in the responses, results for this question will be presented separately. With regard to the on-line questionnaire, the most frequently mentioned barriers to the use of social media to communicate with the authorities were: belief that the authorities do not communicate with residents via social media (40%), lack of trust in the authorities (19%), preference to use social media for other purposes (19%), and lack of time (13%). Chi-Square tests revealed significant associations between the age of the respondents and the lack

of trust in the authorities, $\chi^2(3)=16.22$, $p<0.005$, Cramer's $V=0.36$; and between education and lack of IT skills, $\chi^2(3)=23.27$, $p<0.001$, Cramer's $V=0.43$. Older respondents (55+) were more likely to distrust the authorities than were others. Less educated respondents were the most likely to lack IT skills.

Lack of IT skills was the most mentioned barrier in the paper survey (41%). This is probably due to the fact that mainly non-users answered the question. However 25% still mentioned lack of time as a barrier, 16% did not trust the authorities, 13% did not believe that authorities communicate with residents via social media regarding reconstruction. Chi-Square tests revealed significant associations between both the age ($\chi^2(3)=27.07$, $p<0.001$, Cramer's $V=0.69$) and the education of the respondents ($\chi^2(3)=16.94$, $p<0.005$, Cramer's $V=0.55$) and the lack of IT skills. Older people (55+) with elementary school diploma were the most likely to lack IT skills.

Finally, I asked whether the respondents had used social media to have two-way communication with the authorities during the reconstruction process, and which platform or platforms they had used. Only 36% of the respondents declared that they had used social media to communicate bi-directionally with the authorities. The more highly the respondents were educated ($\chi^2(3)=8.69$, $p<0.05$, Cramer's $V=0.18$) and the younger they were ($\chi^2(3)=11.38$, $p<0.05$, Cramer's $V=0.20$), the more they were likely to use social media in a bi-directional manner. Respondents mostly used Facebook (84%) followed by websites created specifically for the reconstruction (38%). Twitter was used by 10% of the respondents. Blogs and forums within institutional websites were used by 8%, Google Plus was used by 6%, and YouTube by 5%. Males were almost four times more likely to use Twitter than were females, $\chi^2(1)=3.86$, $p<0.05$, $\Phi=.20$.

Figure 4.21 summarizes the responses with respect to attitudes towards the use of social media to communicate with recovery agencies during PDR. A Kruskal-Wallis test showed statistically significant differences according to the age of respondents x , $H(3)=18.67$, $p=0.001$. A Mann-Whitney U test with Bonferroni correction ($\alpha = 0.008$), performed as a follow-up to this result, demonstrated that the younger the respondents were, the more they tended to consider social media important (Mdn: 18–34 = 5, 35–44 = 4, 45–54 = 4, 55+ = 2). A Kruskal-Wallis test also pointed out the differences in considering social media more useful to organise off-line activities with other citizens rather than discussing with authorities, $H(3)=8.06$, $p=0.05$.

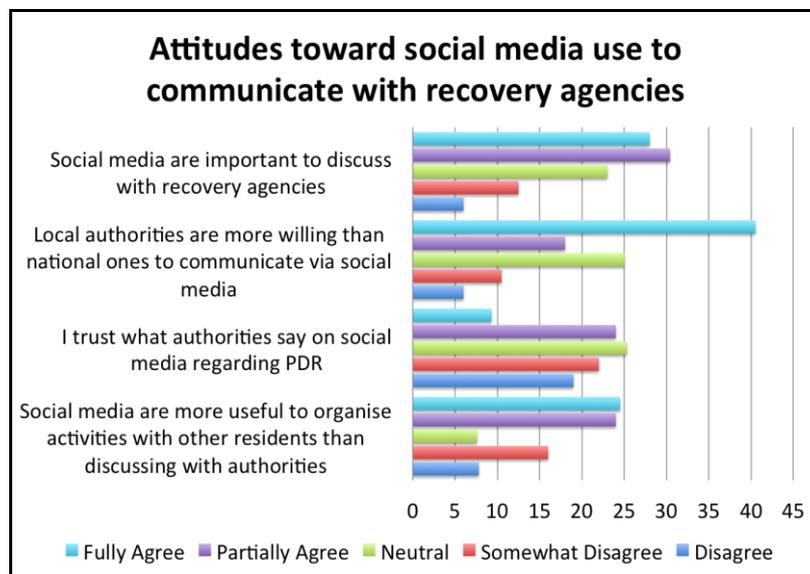


Figure 4.21. Attitudes of survey respondents towards social media use to communicate with recovery agencies

A Mann-Whitney U test with Bonferroni correction ($\alpha = 0.008$) revealed that, the smaller the municipality, the more the respondents considered organising off-line activities via social media (Mdn: <10,000 = 5, 10,000–20,000 = 4, 20,000–30,000 = 3.5, >30,000 = 2).

4.6. Discussion

4.6.1. Communication practices by government agencies

The results of the investigation suggest that G2C communication practices occurring during a reconstruction process are complex and take place through several routines and instruments. The Emilia-Romagna earthquake occurred in a scenario already characterized by high levels of public participation. As a point to note, the web portal “OpenRicostruzione” represents a total innovation. It offers an open data platform that enables citizens to track recovery projects and expenditures. However, traditional means of communication such as public meetings, printed material, telephone, and official websites, still play a key role in providing information about reconstruction. Notably, structured observations and questionnaire responses revealed that official websites were a core component of the information provided to the public. On the other hand, face-to-face meetings represented the preferred communication channels by public authorities during PDR. Social media entered the reconstruction communication landscape, but their use was still limited to informational purposes. Furthermore the lack of comments by citizens on social media posts related to the reconstruction may suggest that the conversation takes place through different means. Indeed, when it came to have a conversation about the reconstruction, the authorities preferred to invite the public to join public meetings rather than engaging in a conversation on line. Interestingly, traditional mass media such as television and radio were less preferred for communication about PDR.

Results obtained through the questionnaire revealed that information regarding housing and infrastructure reconstruction and funds or refunds available to rebuild are a primary concern, followed by the use of donations. Post-disaster literature gives prominence to physical

reconstruction and financing. Results of the survey suggest that this is true also for the provision of information by recovery agencies. Indeed, when a disaster strikes, people may be primarily concerned to see their physical environment reconstructed as living in an environment where devastation prevails may be a continuing reminder of the losses endured and may hinder the whole recovery process (Brown et al. 2011). However, it is worth noting the little attention paid to other critical aspects of a reconstruction, such as the psychosocial needs of the population. A holistic approach that encompasses both social and physical dimensions of the recovery has to be adopted if recovery agencies are to support full community recovery (Philipsborn 2005; Chandra and Acosta 2010). The relevance of information about the use of donations can be explained by the fact that the authorities in Emilia-Romagna endeavoured to make expenditures for the reconstruction transparent through the creation of open data platforms, such as the *OpenRicostruzione e Donazioni sisma* websites.

Given that the information was addressed indiscriminately to all citizens, it is reasonable to conclude that the communication was not tailored to the needs of each social group, which perhaps it should have been. However, homeowners, businessmen and community groups emerged as privileged beneficiaries of G2C post-disaster communication. Once again this provided confirmation of the literature advocating the centrality of physical and economic reconstruction after disasters (Bolin and Stanford 1991; Webb et al. 2002) and the relevance of a community-based approach to the reconstruction (Bolin and Stanford 1998). However, this centrality comes perhaps at the expenses of marginalized social groups, such as the elderly and immigrants, whose information needs appear to be addressed rather less. During recovery from disasters, social marginalisation manifest itself through different levels of assistance received (Kamel and Loukaitou-Sideris 2004) and through uneven access to aid distribution services and

networks (Wisner and Luce 1993; Bolin 2007; Gaillard and Cadag 2009). Results from this study suggest that marginalised segments of the population remain outside the official recovery information provision networks. This potentially diminishes their access to key resources and their ability to recover.

Motivations and barriers to the use of social media during disaster reconstruction reflect some elements already identified in the literature on governmental use of social media in routine times and during disasters (Meaton and Stringer, 2013; Mergel 2015). Although government officers showed awareness of the potential benefits of using social media platforms to discuss reconstruction issues with citizens, results obtained through questionnaires and observations of the social media accounts revealed that their use was still not frequent and was largely limited to informational purposes. In this respect, social media are apparently being used as an additional representation and outreach channel rather than for bidirectional communication or co-production of knowledge (see the social media usage categories developed by Mergel 2013a). Although platforms such as OpenRicostruzione show that web-based communications may enhance transparency and accountability during disaster reconstruction, the potential of social media is yet to be fully exploited.

This study revealed that some of the barriers that prevent government officers from using social media platforms for communicating about reconstruction are similar to the ones encountered in communicating during disaster response (Hiltz et al. 2014). To begin with, the lack of guidelines and of a reference framework that conduct them through the rebuilding process makes it difficult for government officers to produce clear and official communications and to engage in a two-way dialogue. In addition, the use of these tools for bi-directional communication is undermined by concern over the potential circulation of rumours and the

perception that citizens become overwhelmed by negative emotions when dealing with recovery agencies and that they do not have the skills and knowledge needed to discuss reconstruction issues through social media. Lastly, government officers often cite as barriers to the use of social media the lack of personnel and the fact that social media channels may not be appropriate to reach out less technically enabled groups.

Interestingly, some pre-existing communication dynamics seemed to be carried over to the post-disaster communication context. For example, Facebook was the most widely used form of social media by Italian municipalities before the earthquake (OPERA 2011) and the same holds true in post-disaster communication. This may suggest that post-disaster communication occurs via similar channels to the ones already in use prior to the disaster. Furthermore, results show that elected officers were more likely to use social media for two-way communication during the PDR phase; a finding confirmed by national statistics (OPERA 2011). Officials who used social media to communicate prior the disaster kept using these platforms to provide reconstruction information and build dialogue with the affected community.

Looking at the correlations between characteristics of the respondents and communication preferences, some interesting patterns are identifiable. Female respondents were more likely to provide information about psychosocial support services and to communicate via telephone. The literature shows that females differ from males in media preferences and usage, preferring to use media to build relationships and for interpersonal communication (Weiser 2004). The oldest officers located in large municipalities were more interested in providing information about public transportation and traffic plans, while high-level officers more frequently provided information on business recovery. Arguably, in redesigning traffic

plans during the rebuilding, the biggest municipalities encountered the largest problems.

The working position proved to influence the type of communication channels used, as well as the social media used and the barriers to adoption. For example, public relations officers used social media to provide updates about the rebuilding and were less likely to use face-to-face meetings for this purpose. However, elected officers adopted social media more often to engage in a conversation with the public about reconstruction issues. Arguably, this was the case because elected officers need to engage frequently with their constituency, especially during difficult times.

With regards to the barriers to social media adoption, public relations personnel and youngest respondents expressed concerns over data security more often than did other kinds of respondent. As they cover public information functions, PR officers are more focused on ensuring that data are provided and collected in a secure manner. In addition, national statistics (ISTAT 2012) demonstrated that the youngest respondents are more inclined to express concerns over data security. Conversely, civil servants' concerns focussed more on the agencies' lack of interest in social media adoption and the lack of official guidelines for using them, thus suggesting they had little power over decisions about whether or not an organisation would use social media.

4.6.2. Communication practices by citizens

Information collected through field notes and questionnaires provides an interesting insight into the recovery communication landscape. Community based organisations and on-line groups, especially social media-supported groups, played a role in sharing recovery-related information with other

residents, clarifying legal acts and regulations and providing informational support to the affected population. This is confirmed by the fact that some questionnaire respondents declared that they had looked for information from community groups and associations as well as from official government agencies. Thus, community-based groups and organisations should be fully included in the rebuilding plans (Nigg 1995).

Housing and infrastructure reconstruction, funds or refunds, business recovery and damage assessment were found to be the most sought after kinds of relevant information. Again the reconstruction of the physical and economic environments proved to be central to community regeneration after disaster. Interestingly, this was the case for both the on-line and off-line samples with little difference existed between the two.

Local government (i.e. town councils) was the main source of information for the population, followed by the regional council, fire departments and civil protection departments. Literature on post-disaster reconstruction highlights the fact that local government often bears the burden of reconstruction activities and expenditure (Stehr 2001). Results from this study show that this is true also for the provision of recovery-related information to the population. Additionally, this result may also be due to the decentralisation of the recovery and reconstruction management. Local officials were tasked with adapting official decrees to the specific situations of their municipalities and informing the population accordingly. The decentralised structure of the networks that distribute recovery information in the Emilia case study seems to follow from pre-disaster tendencies of decentralisation at the social, institutional and economic levels.

Respondents sought information using a variety of means of communication. Interestingly, communication channels varied significantly depending on whether the question was answered on-line or filled in on the

paper survey. This is consistent with the literature, which shows that results from on-line and off-line data collection may differ notably with regards to the adoption of technology and use of the Internet (Schillewaert and Meulemeester 2005). As the respondents to the paper survey were older and less educated, they were also more likely to use face-to-face interactions and printed material to obtain information. On the contrary, on-line respondents were more inclined to search for information through websites, email or social media. When considering the results within each dataset, the effects of the digital divide were far more evident in the off-line than in the on-line dataset. In the off-line dataset, it appeared evident that older and less educated people remained excluded from the on-line discussions and, in terms of receiving recovery information, they did not derive any advantages from new communication technology. Indeed, they preferred to obtain information through more traditional channels such as television and telephone.

In contrast, the on-line data set showed fewer significant differences in the adoption of technology between people with different ages or levels of education. This implies that the Internet usage and behaviour of the population that engages in on-line discussion is less influenced by socio-demographic factors. Similar findings were shown in previous research, which suggests that social media function as a leveller, diminishing the effects of other socio-demographic factors on political interest and participation (Holt et al. 2013). This finding suggests that government agencies should get the message across through different communication channels, depending on the social group targeted. In contrast to what was found in the studies of disaster response (BBC Media Action 2015; IOM 2014), television and radio were not considered to be useful channels to look for information during the reconstruction process. This finding may

suggest that traditional mass communication channels are not good means of conveying reconstruction messages.

In terms of use of social media during the reconstruction process, both for the on-line and off-line dataset, results showed little evidence of a use of these tools by the population to engage in a two-way dialogue with the authorities regarding reconstruction-related matters. Rather, social media are being used as a platform to read and share recovery information, post queries, exchange opinions and research support from like-minded people who face similar issues. Those who responded to the on-line survey were also more likely to use these platforms to promote activities and protests and to think that information can be collected without the need to interact with authorities. This may suggest that those who participate in social media and on-line groups are more inclined to use this technology for civic and political engagement purposes and to share information among peers. Consistent with previous research, on-line political participation solicits involvement in civic activities aimed at social change (Warren et al. 2014).

Although respondents acknowledged that social media were important tools to communicate with the authorities, lack of trust in what the authorities say about the reconstruction and the belief that they do not communicate via social media restrained people from using these tools to build dialogue with recovery agencies. On-line respondents appeared to be less trusting of institutions than were off-line participants. Additionally, the effects of the digital divide were evident when it came to communicating via social media. Indeed younger and more educated respondents were also more likely to use social media to communicate bi-directionally and they also had more positive attitudes towards the use of social media to communicate with the authorities. Local government agencies were seen as more willing to use social media to build dialogue via social media compared to regional and national ones. Facebook was the most widely

used platform to have a two-way conversation with the authorities. However, according to national statistics, Facebook is also the social media platform most used by the Italian population (Wearesocial 2015) and by Italian government agencies (OPERA 2011). This may suggest that communication during a reconstruction process takes place through channels that were already in use prior the disaster.

4.7. Conclusions

Over the last decade, social media have increasingly risen to prominence as tools that enable citizens and authorities to come together and collaborate. Increased use of social media by government organisations has been linked to increased transparency, leading to greater trust in government by citizens (Song and Lee 2016). Trust in government has proved to mediate the use e-government services (Venkatesh et al. 2016). In this context, recent literature has spotlighted how G2C and C2G communication enabled by new communication technology can result in a joined-up government (Pappa and Stergioulas 2006). Yet little is known about how communication develops during reconstruction after disasters. The Emilia-Romagna case study has shed light on some of the dynamics of the communication by authorities and citizens during PDR and on what role social media are taking in these processes.

The resulting picture shows a complex communication landscape populated by different kinds of actors drawn from both the authorities and citizens. These actors engage in information-sharing activities using a variegated multitude of communication methods that reinforce and complement each other rather than competing. Government agencies show preferences for using face-to-face communications and official websites, whereas citizens' media preferences depend largely on their socio-demographic characteristics. On-line respondents largely rely on the

Internet and social media sites to obtain information about reconstruction, whereas off-line respondents prefer face-to-face contacts and printed material. Social media are used as additional outreach and representation channels by recovery agencies and by citizens as platforms for information sharing and connecting with others by citizens. Building dialogue over matters related to reconstruction by the means of social media proves to be difficult for both authorities and citizens. The former are reluctant to adopt social media during disaster reconstruction due to the lack of resources, time and official guidelines as well as negative comments and inaccurate information that spread easily and quickly over social media. The latter are wary of the government's trustworthiness and willingness to engage in dialogue with citizens over social media and prefer to use these platforms to coordinate recovery efforts with other citizens.

Looking at the directions or target of the communication during PDR, it becomes evident that C2G communication is primarily addressed to local authorities (city or town councils), which are also considered as more trustworthy than regional and national ones. However, field notes and questionnaire results also reveal the importance of community-based groups, both on-line and off-line, as mediators of this communication.

On the other side, G2C communication is primarily addressed to the all the citizens affected but especially to homeowners, business people and community group members as privileged interlocutors. Powerful groups are the ones whose information needs is more easily taken into consideration. This translates into marginal people remaining marginal and societal disparities being ameliorated. Arguably this is one of the reasons why disadvantages groups rely overwhelmingly on informal networks (i.e. bond ties) as trusted information source (Dutta 2009; IOM 2014). According to Bolin and Stanford (1998) community based groups can partially

compensate for failure of government organisations to meet the needs of marginalised individuals during recovery.

Interestingly, both the authorities and citizens claimed that providing and receiving information about the reconstruction of the physical and economic environment are central to community recovery. Lastly, G2C and C2G communication about reconstruction seems to be carried on the same social media sites that were used before the disaster struck.

4.8. Limitations

Limitations should be noted in both the studies. For the study on C2G communication, the sample is probably not truly representative of the whole population. Paper surveys were collected in a homogenous area and on-line responses, although arguably coming from a more widespread geographical area, cannot be verified in their representativeness as respondents were not asked about the municipality they resided in. However, as a point of note, similar communication trends were found in both the on-line and paper survey response. This may suggest that results provide a good snapshot of communications by the population during the post-disaster reconstruction process. Another element that can limit the representativeness of the sample analysed is that respondents were reached through community based organisations and groups, resulting in only members or followers of these groups being surveyed. Future studies should try to verify or challenge the results of this study by approaching a representative sample of the population in order to obtain a clearer and less biased snapshot of the C2G recovery communication landscape.

In the G2C study, in order to ensure the anonymity of the respondents, I avoided asking in the questionnaire the name of the government agency. Therefore it was not possible to determine how many agencies responded to the questionnaire and how representative was the sample. The qualitative analysis of the government agencies' websites and social media accounts partially balanced this bias, confirming some trends identified by the questionnaire results. For example, in opposition to what was found in national statistics, both the qualitative and quantitative analyses revealed that the size of the city was not a significant predictor of the communication that occurs in the reconstruction period. On the other hand, while 48% of the respondents declared that they had used social media to provide information to the citizens during the reconstruction period, the social media account analysis revealed that use for this purpose is very rare. There are at least two possible explanations for these conflicting findings. To begin with, the reconstruction period is long and the communication practices may change over the time. It is therefore possible that the respondents used social media platforms in the early stages and abandoned this means of communication later. A second explanation is that, since that many of the respondents were elected officers, they may have used their personal social media profiles to communicate with citizens. Lastly, my analysis could not account for the communication that took place through direct private messages (for example, through Facebook chat).

4.9. Comparing Emilia-Romagna, Italy and Canterbury, New Zealand

Results obtained from case study research potentially face the bias that they hold true solely in the context analysed. Thus, case study research may fall short in generalizability, a quality of scientific research that

ensures that results can be used to make predictions in a specific knowledge domain. On the other hand, traditional research methods risk overlooking contextual factors that may explain and frame the results. How to ensure that the lessons derived by the observation of the communication dynamics in the context of the Emilia-Romagna reconstruction can be applied elsewhere? A further case study has been established for comparison purposes. The dynamics of communication and social media use between government agencies and citizens during reconstruction process that followed the Canterbury earthquakes in New Zealand will be examined in Chapter 5. Results obtained from the two case studies will be sifted through for cross-case regularities, which will be presented in Chapter 6.

Chapter 5

RESEARCH DESIGNED TO INVESTIGATE COMMUNICATION PRACTICES AND SOCIAL MEDIA USAGE BY AUTHORITIES AND CITIZENS IN THE PDR PHASE OF THE CANTERBURY EARTHQUAKES (SEPTEMBER 2010 – FEBRUARY 2011)

5.1. Canterbury earthquakes: the events

On 4th September 2010 an M_w 7.1 earthquake struck the Canterbury region in South Island, New Zealand (figure 5.1.). The epicentre was located at Darfield, 40 km West of Christchurch (Kachali et al. 2012) and at a depth of 12 Km (Orense et al. 2011). Although the earthquake reached intensity MM8, no one was killed (Johnston et al. 2014). However a handful of people were injured and the shaking generated widespread destruction and serious damage to the land due to liquefaction and lateral spreading. A second earthquake (M_w 6.3) followed five months later on 22nd February 2011. This time the event was located only 6 Km from the central business district of Christchurch and at a depth of 5 Km. It caused a large number of injuries and killed 185 people. It also caused the collapse of houses and buildings labelled as “safe” after the first earthquake (Giovinazzi et al. 2011).

The Canterbury earthquake, often mentioned in the literature as “the Christchurch earthquake”, engendered a massive environmental impact, with liquefaction (and subsequent increases of flood risk), rocks falls and widespread damage to land (Potter et al. 2015). Furthermore, the February event struck the same social and economic system that was trying to recover from the earthquake of September 2010 (Giovinazzi et al. 2011; Stevenson et al. 2011). Notwithstanding this, lifelines responded well (Giovinazzi et al. 2011). The central business district and the eastern suburbs of Christchurch turned out to be the most affected areas. Some neighbourhoods of the Waimakariri and Selwyn Districts were also affected. As a point to note, Christchurch Cathedral, whose construction dated back to the period 1864-1904, sustained serious damage during the earthquake. The cathedral and the square where it is located (Cathedral Square) were considered a symbol of the city and a meeting point for the community in Christchurch. After these two major events, the Canterbury region experienced a swarm of aftershocks over several months, with major ones recorded in June, October and December 2011 (Dalziel and Saunders 2012).

These continued aftershocks, and the sense of uncertainty that they triggered, had a negative impact on the Canterbury region's societal, economic and infrastructural systems and made it difficult to take planning decisions (Vallance 2012). They also prolonged the early recovery period and delayed the beginning of the reconstruction process (Swaffield 2013). The population, businesses and government agencies of the Canterbury region found themselves facing a huge need to recover. Overall, and despite several relocations and forced disruptions of service, businesses showed a high level of adaptability (Seville et al. 2014).



Figure 5.1 Location of Christchurch in New Zealand

A significant displacement of the population occurred as a result of the earthquakes, with people moving to other regions of New Zealand or to Australia (Swaffield 2013; Dionisio et al. 2015). This resulted in disruption of the pre-existing social fabric (Dionisio et al. 2015). The population in Canterbury suffered from the loss of the previously known landscape. The central business district (CBD) and many of the businesses and cultural heritage buildings located within its boundaries were irremediably damaged, as were the largest part of the eastern suburbs of the city (Swaffield 2013).

5.2. The reconstruction phase after the Canterbury earthquakes

5.2.1. *Research context: key events and problems (2012-2016)*

There is no unanimous agreement on the duration and indicators of a

recovery process. However, the recovery strategy prepared by the Canterbury Earthquake Recovery Authority (CERA) divided the recovery of the Greater Christchurch region into three phases: 1. Repair, patch and plan (from September 2010 to December 2011); 2. Begin to rebuild, replace and reconstruct (2012-2014) and; 3. Construct, restore and improve (2015 to 2020 and beyond). At the moment of writing this (in July 2016), the Canterbury region is in the long-term reconstruction phase (CERA 2012).

One of the key events of the recovery process in Canterbury was the establishment of a central government-led authority tasked with overseeing all the aspects of the recovery process in the Canterbury region, the Canterbury Earthquake Recovery Authority or CERA. CERA was invested with exceptional powers with the stated purpose of avoiding delays in the procedures related to the recovery (Chang et al. 2014). On the one hand, the establishment of CERA was seen as a necessity to expedite the recovery without remaining stuck in everlasting bureaucratic issues. On the other, some people regarded it with concern, advocating that it could undermine the democratic traditions of New Zealand (Carlton 2013). Ultimately, these concerns turned out to not be entirely without foundation. The recovery process in the Greater Christchurch area was marked by accusations of the centralization of power and decision processes, conflicts between central and local government over the recovery management, and lack of meaningful and substantial engagement of the population (Johnson and Mamula-Seadon 2014). On this last point, it should be noted that several participatory initiatives were created and supported throughout the recovery period. The Canterbury Earthquake Recovery (CER) Act issued in 2011 mentioned that community participation had to

be a critical point in the recovery planning (New Zealand Parliament 2011). However, according to many local observers, while it promoted public consultation initiatives, central government systematically overlooked citizens' opinions on issues that were crucial to the future of the city and the region (Johnson and Mamula-Seadon 2014). Over the recovery process, homeowners and landowners repeatedly appealed to the High Court, often successfully, to fight the overuse of power by government agencies (Dionisio et al. 2015).

In the opinion of government officers, two other decisions were fundamental to the management of the recovery process in Christchurch (Chang et al. 2014). The first was the re-zoning in June 2011 of the residential areas affected and the buy-out program put in place by the government. Where the land damage was extensive and the buildings were too heavily damaged to be repaired, the Government mandated the compulsory relocation of people and set up a buy-out program in order to allocate the land to other uses. However, the buyout process implied a classification of the properties as red (buy-out) or green (no buy-out); a process that took time and was delayed by continual aftershocks. The decision was taken without any public consultation, which led to public protests and strengthened the concerns about antidemocratic tendencies in the decision-making (Vallance 2014).

The second important event was the decision to cordon off the CBD because the February earthquake extensively damaged it. This led to the relocation of most of the businesses previously located in the city centre and, more generally, of all the socio-economic life that used to occur in this area (Swaffield 2013). The cordon was maintained over an extended

period of time with very restricted and controlled access to the area for utility companies and business owners. It was then successively shrunk until the city centre was fully re-opened (Chang et al. 2014).

The conflicts over the rebuilding of the Christchurch Cathedral (Figure 5.2) are worth mentioning. The cathedral was part of the historical and cultural heritage of the Canterbury region dating back to the end of the 1800s. It sustained severe and extensive damage in the February earthquake, which also caused the collapse of part of the structure.



Figure 5.2. Christchurch Cathedral. *Photo retrieved from https://commons.wikimedia.org/wiki/File:2015-01-04-08839-Christchurch_Cathedral.jpg*

The owner of the building, the Anglican Diocese, decided that it had to be demolished and replaced with a new and bigger structure. While the decision was prompted by CERA, it did not encounter the favor of many local people, who spoke out for the preservation of the historical building (Swaffield 2013). The public debate over the fate of the Christchurch Cathedral was ongoing in 2016.

Several projects, many of them community-led, have addressed the revitalization of Christchurch city centre. As an example, the Re-start project (Figures 5.3-5.4.) used containers to create a large shopping mall and to attract people back to the city centre. Something similar was done in Cavezzo after the Emilia-Romagna earthquake (Northern Italy 2012) when the shopping centre “Cavezzo 5.9” was constructed out of shipping containers.

The recovery procedure was significantly slowed down by insurance issues and by delays in resolving insurance claims. While properties with damage below NZ\$100,000 were repaired in a reasonably short amount of time, those which had the most serious damages (with costs estimated at over \$100,000) found themselves facing long waits, sometimes of several years, before seeing any refund. This last category included the greatest part of the eastern suburbs of Christchurch. The delays in resolving insurance claims resulted in people living in temporary accommodation with poor insulation. They also caused a significant rise in the cost of renting property in the city (Peters 2014). Insurance claim settlements were complicated by the continual aftershocks, as well as the new building codes established after the February earthquake (Chang et al. 2014).

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Figure 5.3 and 5.4 *The Re:start Shopping Mall in Christchurch City Centre. Figure 5.3 was taken during the field trip in August 2015. Figure 5.4. was retrieved from <http://www.citi.io/2016/02/29/shopping-in-shipping-containers-a-tour-of-christchurch-nzs-unique-restart-mall/>*

As a result of this situation and as time went on, some people, especially in the western suburbs, were fully able to complete recovery and move

forward. Conversely, those living in the most damaged suburbs found themselves stuck in an endless battle with insurance companies. The mental and emotional well being of the Canterbury population was severely impacted by loss of landscape and houses, dealing with insurance claims over a prolonged period and continuing to live in damaged houses. A survey conducted by the “*All Right?*” Project (All Right 2014) revealed that those who had their insurance claims settled were more likely to feel satisfied and in control of their future, as opposed to those who were still struggling with claim settlements. These latter were more often angry, frustrated and tired (All Right 2014). Property owners were found to be more likely to feel tired and angry than non-owners (All Right 2014).

Resourcing was another primary issue in the Canterbury recovery. Shortage of skilled professionals attracted qualified construction workers from outside the region and the country (Chang et al. 2012).

The mandate of CERA expired in April 2016 after five years of activity. Throughout 2015, public consultation initiatives were run to seek inputs from the citizenry on the Draft Transitional Recovery Plan that “sets out the framework for long-term recovery arrangements. Many voices have called for a locally led recovery and the empowerment of local people and authorities as opposed to the top-down and centralised management undertaken by CERA (Ainsworth 2015; Meier 2015). Doubts have been raised as to whether the new agency, named “Regenerate Christchurch” will be able to establish a new route to the recovery in Greater Christchurch or whether it will merely carry over the previous centralised approach (Law 2015; Stylianou and Cairns 2015).

*5.2.2. Research context: key actors in the reconstruction between
authorities and citizens*

New Zealand is a country with a strong emergency management system (Webb and McEntire 2012). In 2002 the Civil Defence Management (CDEM) Act replaced previously laws and stressed that the responsibility to manage hazard risk rested primarily on the community and people at risk. CDEM groups were established in each region of New Zealand and comprised local authorities, community representatives, local businesses, lifeline utilities and emergency services. These consortia were tasked with the management of the CDEM issues at local level (Webb and McEntire 2012). The Civil Defence Emergency Group in Canterbury consists of chairpersons from all districts of the region, from the Christchurch City Council and from Environment Canterbury, as well as from local emergency and health management services. Community-based groups are seen as key partners for the implementation of CDEM activities (Civil Defence Group Emergency Management (CDEM) 2014).

The original structure of the emergency management system in New Zealand, as described above, was distributed and decentralised. According to Johnson and Mamula-Seadon (2014) the Canterbury earthquakes changed the recovery governance “*from a national service delivery coordination and support role for locally affected areas, as specified by the CDEM recovery framework, to one of increasing national-level decision-making authority and operational responsibility for recovery activities*” (p. 592). After the September 2010 earthquake, a new cabinet position was created in the person of the Minister for Canterbury Earthquake Recovery. A bill was passed with urgency that expanded the

power of Central Government and created the Canterbury Earthquake Recovery Commission (CERC) (Johnson and Mamula-Seadon 2014). After the February earthquake, the Government announced a state of emergency, which endured until 30 April 2011. In the same month, the newly established agency (CERA) took over the management of the recovery and, under the CER Act 2011, it was provided with exceptional powers to acquire land, demolish buildings and suspend, or amend, regional and local plans and policies (Vallance and Carlton 2015). As a matter of fact, CERA was a national department that reported to the Minister of Canterbury Earthquake Recovery. However the CER Act also envisaged community engagement by means of community forums. These were to consist of a range of local stakeholders with the function of providing local input to the Earthquake Recovery Minister (New Zealand Parliament 2011) at least six times a year. With the objective of revitalizing and re-launching the economy of the city center, in 2012 a Central City Development Unit (CCDU) was established within CERA. Along with Christchurch city and its suburbs, Waimakariri and Selwyn Districts were also affected and were therefore involved in the recovery effort. In the September 2010 earthquake, the Waimakariri District sustained major building collapse and liquefaction, especially in Kaiapoi town (Platt 2012).

As mentioned in the previous section, insurance companies played a key role in the recovery process in Canterbury. New Zealand offers national insurance to cover damage caused by disasters. The Earthquake Commission (EQC) is owned by the Crown and provides natural disaster insurance for residential properties. It assesses damage in residential buildings and land, and manages the insurance claims of the affected people in the Greater Christchurch area (Johnson and Mamula-Seadon

2014). According to Chang et al. (2014) the delays in settling claims have to be ascribed to the number of aftershocks that caused additional damage over several months, as well as to the difficult relationship between EQC and private insurance companies.

With regards to city infrastructure, it has already been noted that the earthquake resulted in severe disruption of the system due to liquefaction and lateral spreading. In order to repair the damage to infrastructure, the Government adopted an alliance model (Killic 2014). In September 2011 it set up SCIRT (Stronger Christchurch Infrastructure Rebuild Team), a consortium of government agencies including CERA, Christchurch City Council and NZ Transport Agency, and five nominated repair companies, namely City Care, Downer, Fletcher, Fulton Hogan and McConnell Dowell. An integrated service team (IST) oversaw the coordination of the activities of all the delivery teams (i.e., the nominated repair companies) and the functioning of this public-private partnership (<http://strongerchristchurch.govt.nz/about/structure>). SCIRT has been particularly active in informing people about and engaging in the repair projects, which often caused disruption of services and inconveniences to the population (Killic 2014).

Environment Canterbury (ECan), the District Health Board and Ngāi Tahu were three more actors involved in the recovery activities. The first is the regional council tasked with the environmental and regional land management of the Canterbury Region. Environment Canterbury is the leading agency of the Natural Environment Recovery Programme, whose goals were to assure sustainable development after disaster, preserve ecosystems and manage the demolition waste appropriately (Potter et al.

2015). Canterbury District Health Board (CDHB) is the government agency responsible for health services in the Canterbury region. Since the rapid increase in anxiety and depression symptoms among the population after the earthquakes, CDHB has established various initiatives to support people's recovery. Among these, it is worth mentioning the "All Right?" campaign (<http://www.allright.org.nz>), which aims to support mental health and wellbeing of the affected population and of the most vulnerable social groups. Ngāi Tahu is the South Island Maori Tribal organization. It has worked alongside local and national agencies to facilitate recovery and in taking major decisions for the future of the Canterbury region. After the September and February quakes, the organizations created the Maori Recovery Network to respond to the immediate needs of the Maori population (Kenney and Phibbs 2014).

The aftermath of the Canterbury earthquakes has seen the emergence of several community-based groups, associations and committees. In their inventory of the community-led initiatives created to support post-disaster recovery efforts in Christchurch, Carlton and Vallance (2013) noted that many of these consisted of associations established pre-earthquake and that subsequently took on recovery tasks. In many other cases, social media, and particularly Facebook, represented fertile soil to support the creation of on-line discussion groups and pages. Indeed many of the community-led initiatives of the Christchurch recovery exist solely in the cyberspace. The stated scope and aims of these initiatives varied significantly. In some cases neighborhood associations and groups were created for advocacy purposes and to push forward the needs of the residents of a specific area in the recovery agenda. The TC3 groups brought together those living on land categorized as at moderate to high

risk of liquefaction. In other cases, the group aimed to fight anti-democratic tendencies in the recovery management and unmask alleged covers-up of relevant issues by government organizations. For example the group “Empowered Christchurch” (<http://empoweredchristchurch.co.nz/>) had the declared purpose to “*research and expose the actual situation and injustices that are happening following the Canterbury earthquakes*” and “*empower and help get fair settlements for homeowners*”. On the same ground, groups like WeCan aimed to denounce injustices experienced by the residents in Christchurch and presented themselves as opposing the top-down recovery management and decision making of CERA. (Vallance and Carlton 2015). Conversely, CanCERN (www.cancern.org.nz) brought together community-led groups and associations involved in recovery activities and collaborated with official recovery agencies in running an information hub, called “In the Know” (<https://intheknow.org.nz/>). As the recovery process entered a new phase and many powers were transferred to new governmental bodies, some of these associations were wound down. For example, in December 2015 CanCERN published its farewell newsletter (CanCERN 2015). Lastly, some other associations and community groups, such as “Greening the Rubble” and “Gap Filler” promoted sustainable post-disaster development and the re-use of the areas in the city centre for community regeneration purposes.

Table 5.1 lists some groups and associations that have a physical office or exist solely on-line, that were created to discuss recovery issues and that were used to distribute the questionnaire.

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Table 5.1 Some groups and associations, either having a physical office or existing solely on-line, created to discuss recovery issues after the Canterbury earthquakes

Name	Scope	Type	Area	Facebook
Rebuild Christchurch	Providing information on the recovery	Non-governmental organisation	Throughout the affected area	Rebuild Christchurch
Gap Filler	Urban regeneration	Community initiative	Christchurch city centre/ Throughout the affected area	Gap Filler
TC3 Residents	Group open to those facing EQC/private insurance issues.	On-line group	TC3 classified land/Throughout the affected area	TC3 Residents
The Christchurch Fiasco	Miles' blog provides information and commentaries he recovery in ChCh	Blog	The Christchurch Fiasco	TheChristchurchFiasco
Dallington residents	Provides information and support to Dallington residents	Neighbourhood association/on-line group	Dallington (Christchurch)	Dallington residents
Chester Community	Keep people in Chester up-to-date with community happenings	Neighbourhood /on-line group	Christchurch city centre/Chester area	Chester Community

With reference to the classifications by Quarantelli (1985) and Stallings and Quarantelli (1985) most of these organisations can be defined as

'emergent'. Indeed, their role and structure were shaped during or after the disaster to face the specific needs and challenges of response and recovery. In the case of neighbourhood groups, they arguably consist of extending organisations, meaning that they formed prior to the disaster and assumed emergency management roles thereafter. For a more detailed classification of these groups, it is possible to refer to the Carlton and Vallance's inventory (2013) of community-led initiatives in post-earthquake Christchurch.

5.2.3. Research context: participatory and monitoring activities during the Canterbury earthquake reconstruction

During the recovery process, various participatory initiatives were organised by the New Zealand Government at both the local and national levels. One of the most famous initiatives was "Share an Idea", a campaign launched by Christchurch City Council a few months after the February earthquake. This campaign was run on line over six weeks in order to seeking citizens' opinions and visions about how they wanted their city to be rebuilt.

Share an Idea was regarded with enthusiasm by the population, which submitted over 106,000 ideas. This outstanding outcome was reached with the use of mixed data collection methods. Indeed people were allowed to submit ideas either in person or on line without having necessarily to move from one place to another (Carlton 2013). The inputs were used by the City Council to inform the draft of the Central City Plan, which had then to be integrated into the final blueprint for reconstruction produced by CERA. According to Carlton (2013) this passage marked the shift from a locally

led recovery to a recovery managed by a national authority. Indeed, although Share an Idea dealt directly with the public, the translation of the ideas into tangible city plans has been a step-by-step process of removing control and ownership from Christchurch's communities (Carlton 2013, p.10). Indeed, while 'Share an Idea' was ultimately a bottom-up effort to collect inputs from residents about the future recovery plans, the final blueprint produced by CERA mainly consisted of top-down decisions. Also, the first initiative was run by the local government (Christchurch City Council), whereas the blueprint was written and released by a central government authority (CERA) in order to expedite the recovery procedures. Likewise, in the interests of timely rebuilding, CERA was provided with exceptional powers, including those of bypassing regulations, acquiring lands and setting out recovery priorities. Property owners were given only a limited right to appeal. The final blueprint envisaged ambitious development plans to attract private investments to Christchurch. Several central areas of the city were destined to accommodate major anchor projects (Carlton 2013). In other words, the need to reduce the length of the recovery process led to a single central authority taking on the responsibility for all the decisions about the rebuilding and setting out recovery priorities. As a matter of fact, although recovery regulations called for collaboration with local authorities and the engagement of residents, CERA had no obligation to follow these prescriptions.

It should be noted that some participatory initiatives were organized by central government in collaboration with Christchurch City Council and local community groups. As an example, the project "In the Know Hub" aimed to convey information to people faced with recovery issues and

procedures. It included the major recovery agencies, as well as representatives of many community-based groups. In order to see their questions on reconstruction and repair answered, residents could attend public seminars and Q&A sessions or consult the project's website (<https://intheknow.org.nz/>) and submit questions. The seminars of the “In the Know Hub” were widely publicized across all the recovery agencies' and community groups' social media pages. Video recordings of the seminars were made available on line in the form of a YouTube playlist (Figure 5.5). Similarly to the “In the Know Hub”, the “Future Christchurch” project was developed by collaboration between Christchurch City Council and CERA. It aimed to provide Canterbury residents with information on the ongoing projects and activities, in particular with regard to the rebuilding of Christchurch.

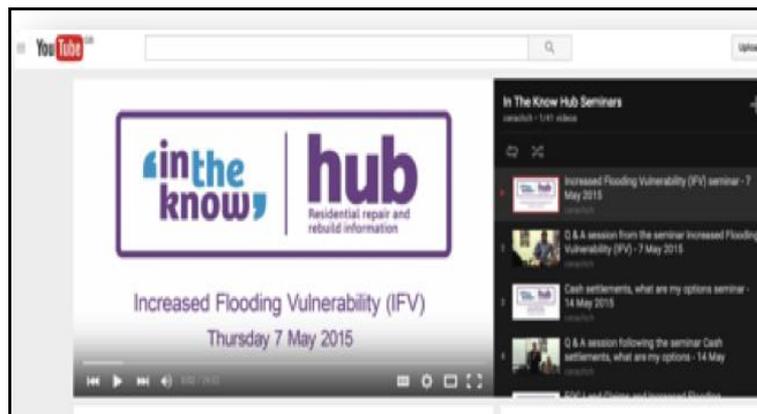


Figure 5.5. YouTube playlists of the “In the know” seminar recordings.

The Future Christchurch website (<http://www.futurechristchurch.co.nz/>) offers various kinds of information on the central city, residential properties and public transportation in Christchurch. It can also be accessed through

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its Facebook page. Future Christchurch includes a monthly on-line and paper newsletter (Figure 5.6). Over 18 months until 31 January 2016, Future Christchurch set up in Cathedral Square a colorful container to give national and international visitors a direct insight into the Canterbury recovery and collect residents' inputs on recovery plans and documents (<http://www.futurechristchurch.co.nz/ever-evolving/visionarium>). In July 2014 the Minister of the Canterbury Recovery launched the 'Canvas: Your Thinking for the Red Zones' campaign with the support of the Waimakariri District Council and other recovery agencies. The core objective of the campaign was to gather people's visions on the land in order to inform how Crown-owned red zone lands should be used (CERA 2014). People could make their voices heard by submitting ideas on the website (<http://www.canvasredzone.org.nz/>), or returning the Ideas Card distributed via post or providing feedbacks during public meetings and workshops (CERA 2014).



Figure 5.6. The Future Christchurch newsletter

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In September 2015 the Waimakariri District Council was directed by the Minister of Canterbury earthquake recovery to prepare a plan for land recovery and use (Figure 5.7). As a result, on 3 October 2015 the District Council published a report called “Let’s Discuss”, with new information on the use of the residential red zone in Waimakariri and future land use plans. In a consultation campaign run from 3 to 31 October 2015, it sought feedback on the community’s needs (Waimakariri District Council 2015). In February 2016 a new document was released called 'Let’s Plan' that “sets out options for proposed long-term land use in the five regeneration areas in Kaiapoi, Pines Beach and Kairaki”. A Facebook page called 'Let’s discuss, let’s plan, let’s do' and a web page (<http://www.redzoneplan.nz/home>) were created to inform residents about these consultation campaigns and to boost discussion.

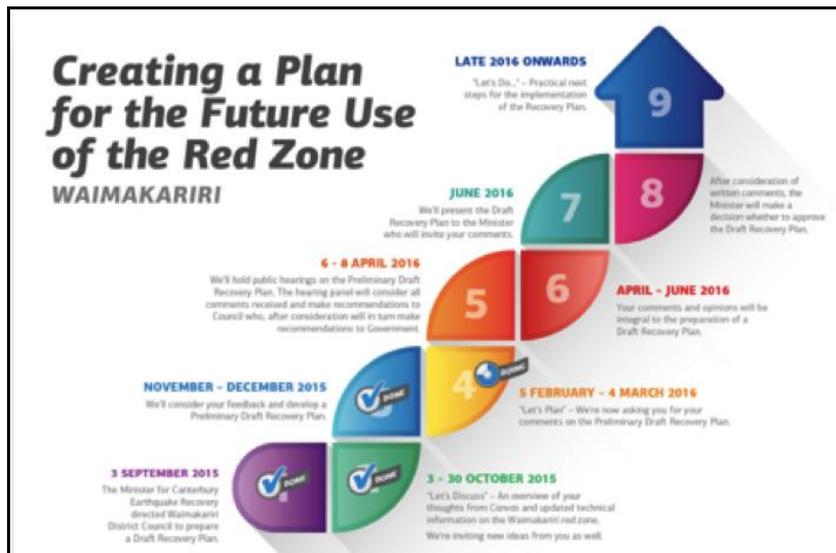


Figure 5.7. Phases of the “Let’s discuss, let’s plan, let’s do” consultation campaign.

It is important to note that consultation campaigns like these were prevalent throughout 2015 in order to seek feedbacks on local recovery plans or on the draft transition recovery plan that sets out plans for the hand over of the power from CERA to a new agency, Regenerate Christchurch. As I will explain, social media played a crucial role in informing and consulting the public about new plans and policies and to collect citizens' input. Despite this, according to the literature on the Canterbury earthquakes and to local opinions, these consultation campaigns did not result in people feeling more engaged in the decision-making process. On the contrary, residents blamed recovery agencies for the lack of meaningful community engagement. As described by Carlton (2013, p.5) *“while comments and suggestions are solicited, they are not afforded due consideration and rarely incorporated into rebuild plans”*. According to some authors (Vallance 2012; Carlton 2013), these anti-democratic tendencies were already evident before the earthquake and have only been exacerbated in its aftermath. In April 2010, elected councillors of Environment Canterbury were replaced with state-appointed commissioners. Retrospectively, this can be considered as an alert signal for the tendency to take power away from local representatives and allocate it to the central state as represented by appointed officials. This tendency persisted over the recovery period and deeply influenced the governance model.

While significant expenditures were made to run public consultation campaigns, some government agencies were blamed for lack of transparency (Simons 2016) and for overfunding PR departments that cared more about defending the organization's public image than providing information and support to the affected residents.

Besides the consultation campaigns, initiatives have been launched to monitor and promote public health in the Canterbury region after the earthquakes. The “All Right?” campaign (<http://allright.org.nz/>) created by the Canterbury District Health Board made massive efforts to reach out to the most vulnerable social groups and give information about mental health support services. Likewise, the 'Recovery Matters' campaign run by the New Zealand Red Cross organized workshops for businesses, organizations and people all across the affected area so as to empower the Canterbury community and support psychosocial recovery (see: <https://www.redcross.org.nz/what-we-do/in-new-zealand/education-programmes/recovery-matters-community-workshops/>)

*5.2.4. Research context: previous communication trends in
New Zealand and in the Canterbury region*

Internet coverage and penetration is good in New Zealand. Over the period 2007-2013 the percentage of users of the Internet increased significantly (Crothers et al. 2014) shifting from 82% in 2007 to 92% in 2013. The Internet New Zealand 2013 Report produced as a part of the World Internet Project revealed that 81% of the respondents considered the Internet as an important or very important source of information, which is more than the 37% that rated radios and newspapers as important and the 47% who used television (Gibson et al. 2013b). This has marked a substantial shift compared to the 42% of people who rated the Internet as important in 2007 (Crothers et al. 2014). In 2013, four out of five Internet users declared that they owned an account on one or more social networking sites. Facebook (70%), LinkedIn (7%), YouTube (5%) and Twitter (2.8%) were the most used. The report further revealed that in 2013

about half of the respondents had accessed on-line government services, marking a steady increase compared to 2007 when only 21% used e-government services (Crothers et al. 2013). Data disentangled by age groups showed that use of the Internet decreased as age increased (with a rapid drop for people over 75) (Gibson et al. 2013). Compared to young people, older people give less importance to the Internet as an entertainment tool or information source (Gibson et al. 2012). Conversely people over 65 years old prefer to retrieve information from traditional media sources (e.g. radio, television, newspapers). Word of mouth holds its importance across all the age groups.

People living in towns and rural areas or in a low-income household were less likely to be Internet users. Ethnicity was also found to be predictor of the information preferences. Maori and Pasifika (the latter defined as people who migrated to New Zealand from the South Pacific region but who have still strong cultural connections with their countries of origin) are more likely to rate other people as an important source of information. A similar study that focused on on-line engagement with government, which was conducted in New Zealand in 2011, revealed that more than half of the respondents had used the Internet to obtain information about public services. Also in this case, the youngest users were more inclined to engage on-line while Pasifika were less inclined than the other ethnic groups (Gibson et al. 2012). Some 40% of people had made use of the Internet to get information about policy issues, 18% to look information about political figures, and 30% for active communication with government. Maori respondents scored high on the first two dimensions, while the rates remained unchanged for the respondents in the age 20-69, dropping off at each end across all dimensions (Gibson et al. 2012). Only 21% of the

respondents agreed that the Internet will give people more political power and 29% regarded the Internet as an effective means of expressing opinions. A slightly higher percentage (43%) agreed that the Internet helps understand politics.

With regards to the Internet and social media use by government agencies in New Zealand, several official documents have been released in recent years to encourage government officers to engage with citizens on-line. A report released by the Department of Internal Affairs (2011) set guidelines for on-line engagement via social media, stating that:-

“Social media is a dialogue that happens between Government and its citizens. This means that the level of control assumed from traditional media is replaced with a deeper level of engagement with the public. The main benefit of social media for governments is that well-considered and carefully implemented social media can create greater transparency, an interactive relationship with the public, a stronger sense of ownership of government policy and services, and thus a greater public trust in government” (p.4)

In 2011, the 'ICT Strategy Groups' launched *Social Media Guidance* to disseminate best practices of social media use across governmental organisations. An analysis by Gartner, a leading company in IT market analysis, defined the strategy the best so far produced (di Maio 2011).

5.3. The role of new communication technologies in the Christchurch earthquake aftermath

In September 2010 and February 2011, when the earthquakes struck the Canterbury region, social media were already fully in use in New Zealand. Immediately after the February earthquake, social media served as a supporting platform for government agencies to send out updates and for citizens to share information and mobilise. On Twitter, information was shared using the hashtag '#eqnz' (Bruns and Burgess 2012). Among the governmental agencies, CERA's (@CEQgovtnz) and Christchurch City Council's Twitter accounts were particularly active in tweeting information while accounts owned by broadcasting media and community groups often served as amplifiers of the official messages. Compared with the September earthquake, the February event produced a larger volume of tweets (Bruns and Burgess 2012). The University of Canterbury made use of social media to share information with students and staff, and Facebook became prominent as a source of information for many months (Dabner 2012). On the same point, soon after the September event, Facebook became the central mobilization point for the so-called UC Student Volunteer Army, a group of volunteers led by Sam Johnson and other students of the University of Canterbury, whose aim was to give practical and emotional help to the affected residents. In this case, Facebook served as a powerful coordination tool for mass deployment of volunteers and for crisis communication (<http://www.sva.org.nz/history/>). Another volunteer-led initiative that harnessed new technologies was the Christchurch Recovery Map (CRM). CRM was a real-time map of the earthquake affected areas and represented a way to crowdsource, display and re-distribute data about location and the practicality of essential

services during and after the disaster (Bourk et al. 2015). Government agencies faced overwhelming difficulties to fully integrate the information produced and managed by emergent groups into on-line platforms for their response and recovery activities (Bourk et al. 2015). On this point, in abandoning a centralized approach to disaster communication and in harnessing citizen-based web initiatives government agencies fell short (Bourk and Holland 2014; Bourk et al. 2015)

Several on-line groups were established after the earthquakes and they carried over their activities during the reconstruction period. According to the inventory prepared by Carlton and Vallance (2013), many of the community-led initiatives and organizations that took on recovery tasks existed merely as on-line groups. Some of these groups actively challenged the top-down approach put in place by some recovery agencies. They used social media to propose “an 'alternative reality' of the recovery process. In this respect the study conducted by Simons (2016) confirmed that social media were considered by members of the on-line groups to be a source of information that was more trustworthy than official and mainstream media. This resulted in these groups becoming “insular, defensive and anti-governmental in nature” (Simons 2016). The little disaster scholarship that addresses the use of social media in the long-term disaster recovery phase (Farinosi and Trerè 2010) notes that social media come to prominence in the recovery period as an “alternative public space” in which residents share recovery information and discuss problems in opposition to what is recounted in the official information outlets. As happened for the L’Aquila earthquake (where, despite the many examples of failures, recovery was presented as a sort of “miracle”), in Christchurch alternative narratives on social media countered the

Government's accounts of success. . Sarah Miles described well this process in a blog post published on March 26, 2013: -

“Behind the scenes there is a dearth of information exchanging hands and being created. No longer are people isolated, they are using social media to fill the communication gap which is generated by the mainstream media. Social media provide the opportunity for the public to actively engage in the creation of information and acquire knowledge, rather than to be passive consumers. This is a way of counteracting the imbalance of access to critical information which would assist them in resolving some of the problems they face – such as the resolution of insurance claims and dealings with organizations such as CERA and EQC”.

What Sarah Miles described here is a process, enabled by new communication technology, by which people become producers and brokers of information, rather than merely consumers. In this newly created communication landscape, the dearth of accurate and trustworthy information by government agencies and mainstream media was balanced through making use of the set of knowledge and skills brought by ordinary citizens who interact on social media. Social media were also used to produce satirical videos and comics in order to unmask the real situation that people were experiencing. Videos were uploaded on YouTube, such as “the EQC blues” (<https://www.youtube.com/watch?v=90YGqCbSfY>) or “Meet the Muntstones” (<https://www.youtube.com/watch?v=hflLiz0PUDU&feature=share>). These have been ways to express frustration over the management of some aspects of the recovery. The history of the shopping centre at South New Brighton (one of the coastal areas in the eastern suburbs most affected by

the earthquake) is emblematic. CERA decided to close and then demolish the shopping centre because a crack was found. Apparently no consultation was effected before this decision but a few days after the demolition CERA put up a sign asking people what they wanted in the empty space. Residents reacted producing a video of protest about this lack of engagement in the decision-making (“What’s worse, a crack in the wall? Or the sound of nothing happening at all?” sings a girl in the video - <https://www.youtube.com/watch?v=ZtHqUaviveg>).

New technologies also served to make information sharing between the stakeholders involved in the recovery process easier. Dionisio et al (2015) presented a project called “Greening the Greyfield”, in which in the post-earthquake context in Christchurch geospatial tools are envisioned as platforms for the production of shared development scenarios, participatory urban planning and engagement between groups.

5.4. Specific research goals and methodology: similarities and differences with the Emilia-Romagna case study

Research goals similar to the ones investigated for the Emilia-Romagna case study were established for comparison purposes. In so doing, it was possible to compare communication practices by government agencies and citizens in the aftermath of disasters that occur in different socio-cultural contexts. Communication preferences and social media use may vary according to cultural norms. The purpose of conducting case studies in different post-disaster scenarios was to detect regularities within the communication practices and the role, motivations and barriers to social media usage in the context of reconstruction. In addition to the research

methods described in Chapter 3, semi-structured interviews were carried out with some government officers and community group representatives in order to gain insight into how the communication practices and role of social media evolved over the reconstruction period and into the factors that may influence them.

For the largest part, the questionnaire used for investigating the Christchurch case study mirrored the one used in Emilia-Romagna. Similar terminology and options for questions and answers were applied, although sometimes they were adapted to the specific context. The reconstruction period was made to start from three months after the earthquake of February 2011. In fact, the emergency period ended in April 2011 and simultaneously CERA began to operate as a lead agency.

Some changes made to the questionnaire need to be highlighted. The development of the questionnaire was guided by the advice of Dr Suzanne Vallance, a lecturer from Lincoln University, New Zealand. Dr Vallance is an expert in community engagement and community-based groups in the aftermath of the Canterbury earthquakes (see, for example, Vallance 2013, 2015). She suggested some minor changes to adapt the questionnaire to the New Zealand culture and to the specific post-disaster context in Christchurch. In detail:-

- The term 'citizen' was replaced with "resident"
- In the question about the frequency of use of communication channels, the answer options 'High', 'Medium', 'Low' and 'None' were replaced with clearer indications of timeframe ('once a week', 'once a month', 'a few times a year', 'never')
- The term 'authorities' also encompassed private companies involved in

recovery efforts. Indeed, the Christchurch reconstruction was marked by private-public partnerships and by the use of nominated repair companies to restore the infrastructural system (e.g. SCIRT). Thus, private companies (e.g. Fletchers) played a role that was similar to the one covered by established government agencies (e.g. city and regional councils).

A few more questions were added to the questionnaires in order to examine other factors that may influence communication practices and social media adoption during disaster reconstruction. Regarding the authorities' communications, I explored the perceived level of innovation acceptance within the agency by the means of a Likert scale. I also investigated the presence of a dedicated staff for IT services. The question about the size of the municipality in which the agency operated, which in the Italian case proved to affect the adoption of an IT system, was not applicable to the Christchurch context. In New Zealand, municipalities with fewer than 30,000 residents are governed by a single entity, namely, district councils. The question was therefore removed from the survey. With regard to the questionnaire for citizens, I added a question about the respondents' annual income, which was not deemed culturally acceptable in the questionnaire for Italy. I also added a statement to measure the general level of engagement of respondents in online social and political discussions not necessarily related to the recovery process and the perceived level of usefulness of social media sites for building dialogue with the recovery agencies.

5.4.1. Construction of the interview guide

Informal interviews carried out during the Emilia-Romagna case study revealed that communication practices change according to the phase of

the recovery one investigates. Thus, I performed semi-structured interviews with recovery officers and community group representatives in Christchurch and surrounding areas. The intent was to answer the question about whether and how communication practices changed in each phase. The interview guide was constructed to generate short and highly focused interviews and gain insights into the following areas: -

- Phases of the reconstruction process after the Canterbury earthquakes of February 2011 including turning points.
- Communication dynamics and changes in these dynamics within each phase.
- Motivations for using and barriers to use social media for communication about reconstruction.
- General communication issues.
- Opinions about the role of social media during the Canterbury rebuilding process.

5.4.2. Data collection and analysis

During August 2015 I conducted a two-week field trip to Christchurch and other earthquake-affected areas in the Canterbury region. Similarly to the Emilia-Romagna case study, the field trip was used to gather contextual information through field notes and informal interviews with residents and government officers working on the recovery. During the field trip, semi-structured interviews were conducted with representatives of community groups and recovery officers. In total, 11 interviews with recovery officers and 13 interviews with residents were audio-recorded and then

transcribed. Structured observations of government agencies' websites and social media profiles were performed between June and November 2015.

The link to the on-line survey for residents was published on the Facebook page of community. Officers were allowed to choose whether to fill the survey on-line or by hand. Information about modes of data collection and analysis can be found in Chapter 3 of this dissertation.

5.5. Analysis of the results

5.5.1. Observations during the field trip and data collection in Christchurch

In the opinion of various government agencies and residents, the reconstruction of earthquake-stricken areas had started a few months before my field trip. The previous years had instead been devoted to the demolition of damaged buildings and the repair of infrastructure. In August 2015 the city had the aspect of a big construction site, especially in areas such as the city centre and some eastern suburbs (e.g. New Brighton). From the words of the people interviewed, it became clear that the city was split between neighbourhoods and people who had been able to move forward and those for whom the recovery process was far from complete. Notably in the eastern suburbs of New Brighton, the environmental impacts of the earthquake (such as liquefaction and rock falls) were still evident and residents were suffering from increased flooding risk and land damage.

With regards to recovery communications, receiving information about land

damage and about how to deal with private insurance companies was a major concern for many residents. During the fieldwork, I had the chance to participate in a community meeting and listen to the stories of homeowners who resided in the most affected areas. They complained about the lack of clear and transparent information regarding the extent of the land damage and ground deformation and the resulting environmental risks. How much of the land was deformed (e.g. subject to uplift, liquefaction or subsidence)? What will happen to a property that is now at risk of floods as a result of this deformation? Which measures will insurance cover for building damage remediation and which for land damage remediation? In particular, some community groups blamed the government agencies for holding back crucial information about environmental risks and for producing hazards maps that did not reflect the actual areas of risk. According to some residents (see for example the Facebook groups named “Empowered Christchurch” and “The South Brightside”), areas with massive environmental risks have been placed in the green zone and therefore excluded from governmental recovery programmes such as the buy-out option. Owners of property in this area have found themselves in the position of living in a hazard prone area without the opportunity to re-sell the property because the value of the house has dropped in the meantime.

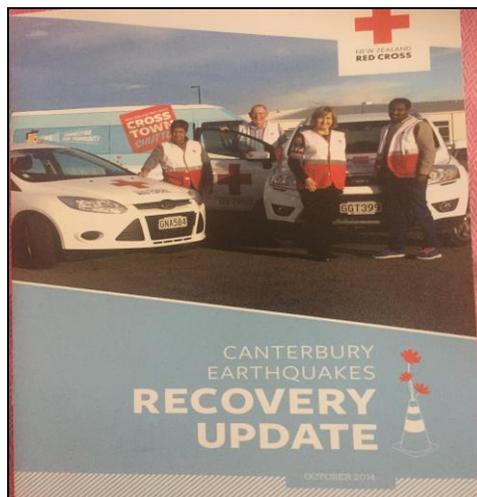
One positive aspect was the participation within this community meeting of a representative of Christchurch City Council. This may suggest that some government officers harness and collaborate with community groups in the provision of information to residents. However, central government agencies such as CERA and EQC were generally depicted as less trustworthy and guilty of controlling the information released. In particular,

CERA was accused of having overfunded PR departments whose only objective was to produce PR communications rather than information aimed at real and meaningful engagement. As a point of note, all the residents I spoke with regarded the campaign "Share an Idea" run by the City Council in May 2011 as an excellent initiative which was able to stir the population's enthusiasm and spur discussions about rebuilding and revitalisation plans. However, according to their opinions, the ideas collected through this campaign were barely included in the final recovery plan. Other major decisions, such as the rezoning, were taken without any sort of consultation. As a result, despite the frequency of public consultation campaigns, people became less trusting in the authorities and less willing to give their opinion on the reconstruction. The feeling that authorities would ultimately take the decisions with little to no consideration of the citizens' opinion was broadly shared.

As far as the communication channels used to provide recovery information were concerned, it was evident that recovery agencies made use of a multitude of means of communication to get the messages across. These included face-to-face public meetings, printed material (leaflets, pamphlets and brochures), radio advertising, communications through official websites, and social media. The government officers generally regarded social media as a useful mean to reach out a broader audience. Although both recovery officers and residents interviewed acknowledged the potential of social media for community engagement in the reconstruction process, many highlighted the need to use multiple communication channels at the same time. This need drew from the consideration that not all of the targeted audience was willing or able to use social media and people needed something to take away without

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having to keep in mind all the information. Figures 5.8 and 5.9 offer examples of recovery communications by means of printed material.



Figures 5.8. and 5.9. Some booklets produced by SCIRT and NZ Red Cross

SCIRT ran a massive communication campaign to explain the scope of the agency (“who we are”) and the type of work that they had to conduct in order to repair the infrastructure system of the city (figure 5.8). Due to the need to communicate highly technical information to a non-expert audience, SCIRT’s communication campaign was particularly challenging. The agency used public meetings and printed materials to convey difficult messages about infrastructure and road works. Brochures, leaflets and pamphlets were left in letterboxes, inviting people to attend drop-in sessions, while posters were affixed in public malls and shopping centres (Figure 5.11). Whenever possible, in order to ensure the engagement of ethnic minorities, printed material was made available in languages other than English. The campaign “*All Right?*” adopted a series of communication channels, including social media, to reach out the most vulnerable and ensure that their mental health needs were being addressed (Figure 5.10). For example the campaign’s Facebook page was used to promote quizzes and contests

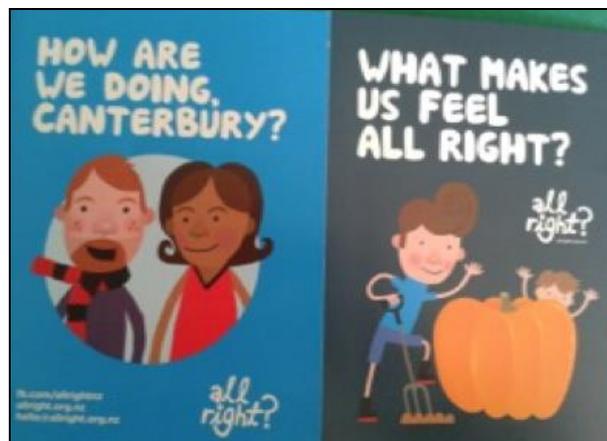


Figure 5.10. A leaflet of the All Right? campaign

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Figure 5.11 Communication by SCIRT in a mall in Christchurch

5.5.2. Communications and social media usage by government agencies in the reconstruction phase following the Canterbury earthquakes

Survey responses

Twenty-six (N=26) government officers responded either to the off-line or the on-line questionnaire. They consisted of nine SCIRT employees belonging either to the nominated repair companies or to the overarching Integrated Service Team (IST), two members of the Regional Council (Environment Canterbury), five workers of District Councils (three from Waimakariri and two from Selwyn District Councils) and three of Christchurch City Council. The remaining participants worked for CERA (N=2), NZ Red Cross (N=1), Canterbury District Health Board (N=1), EQC (N=1), NZ Police (N=2). The respondents were predominantly women (73.1%) and the age ranged between 24 and 72 years old (M=43.6, SD±15.17). For the greatest part, they were employed in a PR/communication positions (73%) or were senior officers or managers (15.8%). Only one was an elected officer and two covered technical positions within the agency. Responses revealed that participants in this research were frequent users of social media within their agency, and that they used this tool every day (46%) or several times in a week (38%). The large size of the agencies surveyed allowed for the maintenance of a fully operational communication department to whom the survey was forwarded. It did not therefore come as a surprise that respondents belonged mainly to this department and were familiar with social media platforms. Looking at the information most commonly provided during the reconstruction phase (figure 5.12), information about traffic plans and public transportation (57.7%), housing and infrastructure reconstruction

(53.8%), psychosocial recovery (30.8%) and environmental risks (26.9%) emerged as pivotal. Figure 5.12 lists the information by percentage.

Information was addressed primarily to all residents (96%). However homeowners (46%), community groups (46%) and businessmen (27%) were also widely targeted.

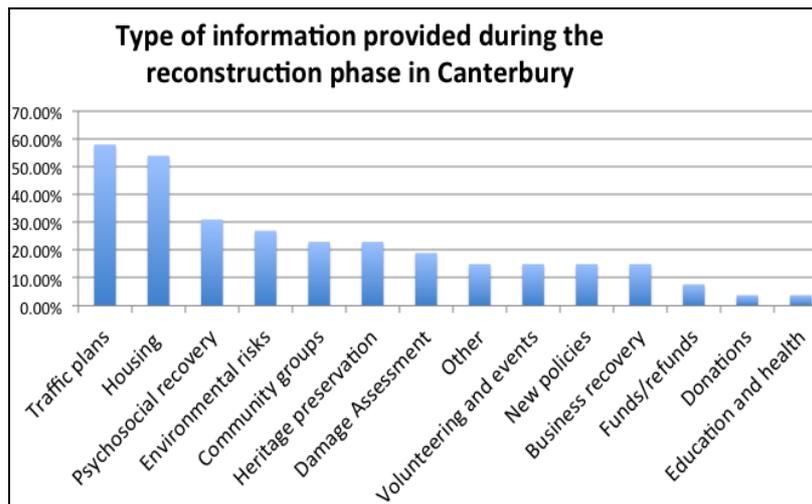


Figure 5.12 Information provided by recovery agencies in Canterbury by percentag

Table 5.2 shows how frequently communication channels were used to provide the information selected. Results show that government agencies adopted multiple means of communication to convey recovery information.

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Table 5.2. Channels used to provide information about recovery in Canterbury

	Once a week	Once a month	Few times in a year	Never
Internet	68%	12%	20%	0%
Social media	60%	12%	23%	8%
Phone	56%	20%	8%	16%
Face2 face	64%	8%	24%	4%
Printed	52%	24%	20%	4%
Television	8%	4%	32%	56%
Radio	8%	32%	40%	20%

The Internet (websites and emails) and face-to-face interactions were used most frequently. Social media also had a relevant role in information provision, along with printed material and the telephone.

Some 40% declared that they used radio between once a month and once a week. As a means of communicating news about the reconstruction, television was largely irrelevant.

The second part of the questionnaire was employed to analyse the use of social media by government organisations in Christchurch during the reconstruction process. In the greatest measure, government officers declared that they used social media to post information about reconstruction (77%) and to answer residents' queries and comments

(62%). A minority used them to ask for residents' opinions (12%) or to sign petitions (4%). None asked residents to collaborate in the resolution of reconstruction-related issues via this means of communication. However, 12% did not use social media for any purpose related to the reconstruction. Lastly, 8% mentioned that social media had made people aware of grants or that trust and confidence had been built by using social media platforms.

Barriers to social media adoption to communicate with residents during PDR included lack of personnel (26.9%) and the fact that an agency had other priorities (19.2%). However, 19.2% declared that they had no problem. Other barriers frequently mentioned included: security issues (15.4%), lack of official policies (15.4%) and lack of time (15.4%). A few people expressed concerns about potential legal problems, high costs and social media being not useful for the problem in question. Two respondents highlighted that their agency was concerned about the consequences of using Facebook and that social media do not allow one to target specific audiences.

Despite these barriers, 69.2% of the respondents declared that they used social media platforms for two-way conversations with residents during the PDR phase. Of these, 88.9% used Facebook and 76.5% Twitter. At large distance followed websites created for the reconstruction (35.3%), YouTube (17.6%) and blogs (11.8%).

Figure 5.13 highlights the responses regarding the attitudes toward the use of social media during PDR by the government officers surveyed.

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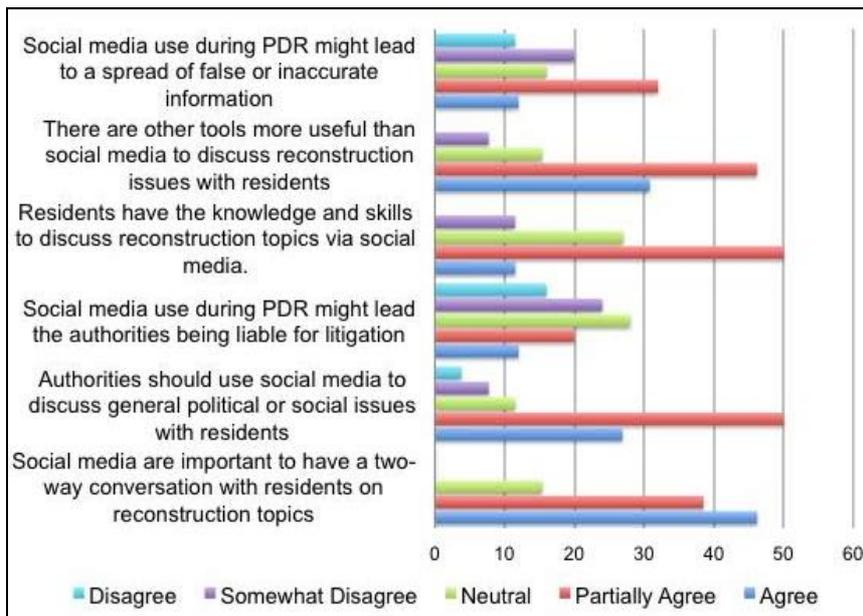


Figure 5.13. Attitudes toward the use of social media during PDR by the government officers surveyed.

As shown, the greatest number of respondents agreed or partially agreed with the statement that social media were important in order to have a two-way conversation with residents about reconstruction. Likewise, many agreed that the authorities should use social media to discuss general social and political issues with residents, although the percentage of people who *partially agreed* with this statement was higher. Less clearly cut responses were given to the statement that discussing issues and topics related to the reconstruction via social media might lead to liability or to the spread of misinformation. In particular, the majority of respondents seemed to be concerned that social media communications may produce a rapid spread of inaccurate information. When asked whether they thought that residents had sufficient knowledge and skill to discuss issues and

topics related to the reconstruction with authorities via social media, half of the respondents partially agreed but many were non-committal. Although social media were considered important tools for PDR communication, the greatest number of respondents agreed that such tools are more useful for discussions with residents about reconstruction.

Lastly, I gathered information on some organisational dimensions that were shown in the literature to influence social media usage by organizations, including level of innovativeness, size of department, stakeholders' influence on organisational decisions and presence of a designated person to manage websites and social media profiles (Oliveira and Welch 2013). Over 84% of the people surveyed declared that their agency had a designated person to manage on-line services. The perceived level of innovativeness was also reasonably high, with 46% of the respondents agreeing that their agency had a strong commitment to innovation and 50% partially agreeing. Half of the respondents also agreed that employees are rewarded for developing innovative solutions in the agency. As far as the perceived level of influence that residents' opinion can exert on the organisational policies was concerned, over half of the participants stated that it had some influence and 27% marked a very strong influence.

Inferential analysis revealed that those who did not work in PR and communication departments were more inclined to mention the lack of time as a barrier to the use of social media ($\chi^2=8.81$ (Yates continuity correction), $p<0.05$, $\phi=0.000$) compared to communication officers. Those above 55 years old targeted community groups' representatives ($\chi^2=6.57$, $p<0.05$, Cramer's $V=0.037$) and answered queries ($\chi^2=7.40$, $p<0.05$, Cramer's $V= .025$) more frequently than did younger officers. A

Mann-Whitney U Test revealed that officials between 35 and 54 years old (Mdn=3) used social media (U=20.5, $p=0.044$, $r=-0.47$) more than those below 35 years old (Mdn=2). They were also more inclined to adopt television (Mdn=1) (U=14.5; $p=0.041$, $r=-.51$) and radio (Mdn=2) (U=16.5, $p=.046$, $r=-0.48$).

Analysis of official websites and social media profiles.

Recovery agencies' official websites were examined in order to investigate either the presence of a section dedicated to the provision of information about reconstruction or the creation of a separate page. Agencies whose only purpose was CERA and SCIRT) were excluded from this analysis. Table 5.3 summarises the findings of the analysis. As shown, the greatest majority of the government agencies in the Canterbury region and New Zealand had dedicated sections within their websites for the provisions of updates on the reconstruction. Some agencies also offered information via alternative webpages. In the case of Christchurch City Council and Waimakariri District Council, the Mayor set up a personal blog on which to give information about rebuilding. Additionally, and as already mentioned in the section on participatory activities, the 'Future Christchurch' initiative jointly developed by Christchurch City Council and CERA and the Red Zone Plan initiative by the Waimakariri District Council had its own web pages and social media profile.

Looking at the social media profiles, all the government agencies, including CERA and SCIRT, had an account on at least one social media outlet. Of these, nine out of 11 (82%) had a Facebook page, all (100%) had a Twitter profile, five used YouTube and one Vimeo. Photo sharing applications were also adopted: two adopted Flickr and two Instagram. Lastly, LinkedIn

was used by three out of 11 government agencies. Among the agencies with more social media accounts, Christchurch City Council was present on Facebook, Twitter, LinkedIn, Instagram, YouTube, Google Plus and Flickr; the Waimakariri District Council on Facebook, Twitter, YouTube, LinkedIn and Flickr and District Health Board offered information on Twitter, Facebook, Vimeo, LinkedIn and Media releases.

Social media profiles of the government agencies shown in Table 5.3 were monitored over a six-month period (March 2015-August 2015) to gauge whether these platforms were used for purposes related to the reconstruction, how frequently they were used and with what scope (i.e., to give information versus engage in a conversation). During the period analysed, official hearings were held to gather opinions on the Transitional Recovery Plan. Again SCIRT and CERA were excluded by the analysis, as their only scope was to provide information on the reconstruction. Seven out of nine government agencies used their social media profiles to provide information about reconstruction at least once during this period. Among the social media platforms, Facebook and Twitter were by far the most widely used for this purpose. Christchurch City Council was the most active, with between 30 and 40 updates posted on both Facebook and Twitter. The public frequently commented on Facebook posts, which were replied to by the City Council's social media team.

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Agency	Dedicated section?	Other pages?
City Council	http://www.ccc.govt.nz/the-rebuild/about-the-rebuild	http://www.futurechristchurch.co.nz/ http://www.lianne.co.nz (Mayor's personal page)
Waimakariri District	http://www.waimakariri.govt.nz/services/emergencies-and-recovery	http://www.redzoneplan.co.nz/home https://davidayers.wordpress.com (Mayor's personal page)
Selwyn District	http://www.selwyn.govt.nz/my-property/earthquakes	None
District Health Board	None	None
Eqc	http://www.eqc.govt.nz/canterbury	None
Environment Canterbury	http://ecan.govt.nz/advice/emergencies-and-hazard/Pages/info-canterbury-earthquakes.aspx	None
Fire Department	http://www.fire.org.nz/Christchurch-Recovery/Pages/Facts-and-Figures.html	None
Red Cross Nz	https://www.redcross.org.nz/what-we-do/in-new-zealand/helping-in-canterbury/	None
Police Service Nz	None	None

Twitter was used to retweet the tweets of other recovery agencies. This shows engagement with other agencies and integration of the recovery messages across the agencies.

Of the remaining agencies' social media profiles, fewer than ten updates were provided over the timeframe analysed. Waimakariri District's official Facebook profile offered little information on the reconstruction. However, the Facebook page of the Red Zone Plan initiative was completely dedicated to this topic (<https://www.facebook.com/LetsDiscussLetsPlanLetsDo/?fref=ts>). New Zealand Red Cross, EQC and Environment Canterbury used their social media accounts to provide information more on disaster preparedness than on recovery and reconstruction.

The reasons for adopting social media during the period of reconstruction were recorded by screenshots taken during the period under analysis. On the one hand, social media were powerful tools to communicate updates to the public, invite the audience to show up in public meetings and drop-in sessions (figure 5.14) and reply to comments and complaints.

On the other hand, new and advanced means of usage emerged from the analysis, such as the ability via social media to gather citizens' opinions on matters related to the reconstruction (figure 5.15). This was particularly evident in Christchurch City Council's and CERA's social media profiles. Social media platforms were used by these organisations to allow citizens to have their say on important matters, including long-term plans for recovery and reconstruction in Canterbury



Figure 5.14. Facebook post by Christchurch City Council inviting to take part in the consultation campaign.

For example, Christchurch City Council ran a consultation campaign to decide upon the points that needed to be included in the final Christchurch City Recovery Plan. Citizens were requested to submit their ideas either in public meetings or via social media (Figure 5.15). However, for both privacy and legal reasons, formal submission could only be achieved via an official form on the website (formal submission requires that a name and surname be provided). Similarly, CERA offered several channels, including social media, for citizens to give their opinions on the Transitional Recovery Plan. Figure 5.16 shows that a hashtag was set up by the social media team to collect all the ideas on the red zone offer.

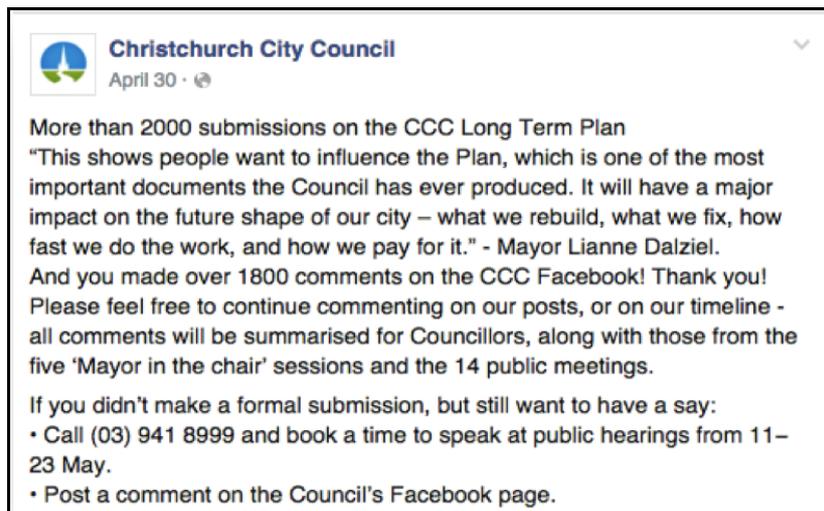


Figure 5.15. Facebook post by Christchurch City Council. In this post, government agency asks citizenry to submit ideas for the Christchurch City Council Long Term Plan

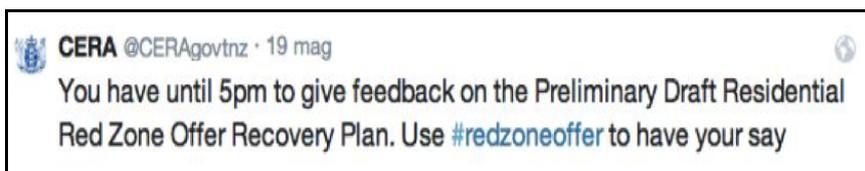


Figure 5.16. Tweet by CERA inviting to submit ideas for the Red Zone Recovery Plan by using the hashtag #redzone

However many social media posts carried harsh comments by residents, who expressed a sense of distrust toward the agencies' willingness to listen to the community. Figure 5.17 shows comments on a CERA post. Frustration and vague ideas about how the reconstruction should be carried out emerged in the comments, making it clear how managing negative comments via social media can be a difficult and energy-

consuming task. Specifically, people on social media expressed frustration and anger over the lack of meaningful engagement of the public in key decisions concerning the reconstruction (e.g. the initial re-zoning) and hypocrisy of CERA in looking for a community's feedback only after that the Supreme Court had requested that the new recovery plan be submitted to public input.

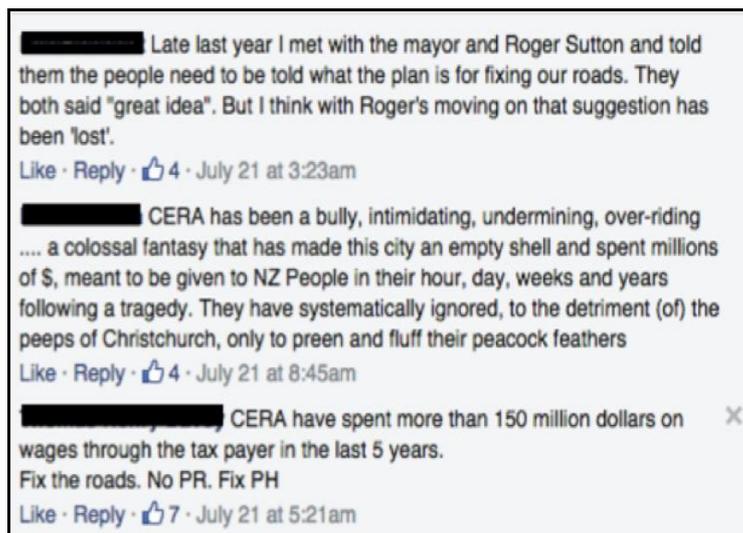


Figure 5.17. A bunch of comments below a CERA post.

Other commentators tried to push forward individual issues. For example, in some cases, people complained that they were not receiving adequate responses to their queries and that the lack of clear answers was a function of political considerations.



Figure 5.18. A comment showing criticisms over the lack of engagement of the population in crucial decisions of the recovery.

Thematic analysis of interviews

Eleven interviews with government officers were carried out during the field trip in August 2015. All the interviews were conducted face-to-face except one that was conducted over the telephone. The interviews consisted of six short questions that intended to look into the general research issues as well as the evolution of communication processes during the reconstruction period. Interviewees were prompted to think about the phases of the reconstruction process after the Canterbury earthquakes and how communication and social media use changed during this period. The last question was open to any considerations of communicative processes that were not probed explicitly in the questionnaire or in the interview. The interviews were audio-recorded and then transcribed. General themes were extracted by means of thematic analysis. More

details on the procedure followed in analyzing the interviews can be found in Chapter 3. Below, I describe the themes identified.

THEME 1: RECONSTRUCTION IS A TRANSITIONAL PHASE WHOSE DEFINITION DEPENDS ON INDIVIDUAL CIRCUMSTANCES

As mentioned, the first question prompted the respondents to think about the stages they went through during the reconstruction process. They were invited to discard the period immediately after the earthquake and focus on the long-term period, starting from three months after the February earthquake. In relation to this question, four codes emerged.

- *Definition of reconstruction*: how reconstruction can be defined and problems that emerge in definition
- *From response to reconstruction*: references to the characteristics of the response stage and how they changed over the reconstruction period.
- *Turning points in the Canterbury reconstruction*: references to the turning points in the Canterbury reconstruction
- *Current reconstruction phase*: references to the phase that the Canterbury region is currently experiencing.

Data were aggregated to form the theme mentioned above.

According to the interviewees, the reconstruction phase was not a clearly cut process. Stages often overlapped and new aftershocks brought people back to the emergency phase. Although some important events could clearly be identified in the Canterbury earthquakes reconstruction, it was

evident that the definition of reconstruction itself might depend on the individual circumstances: -

"I think for individual groups, it depends very much on when things happens to you and your house and your neighbourhood.

"Recovery is not a clear cut journey, the stages overlap all over the place, we know that there are different stages and that now we are going into the long-term recovery (...) we still have people dealing with individual housing issues. There are probably some big turning points but for some people it has not been so clearly cut."

There was a shared feeling among the interviewees that some people and part of the city were able to move forward faster than others. In few other cases, people that experienced the most severe damages lagged behind and remained stuck in a "waiting status" due to endless insurance claims.

"Turning points can be the assessment of people's home, the assessment of the land, the decision on which land would be red zoned, the development of new areas which tended to be north-south and west and a lot of people were waiting, waiting, waiting, waiting and seeing other people being able to move on and wondering why you weren't able to move on and the despair around that..."

The response phase and its timeframe and definition were far clearer in the minds of the respondents compared to the reconstruction phase. During the interviews, clear memories emerged of the initial response and solidarity among neighbours and the sense of community that followed the earthquakes. Conversely, the stage of recovery was more difficult to

define. People were able to identify key events, such as the setting up of CERA, land assessment and re-zoning, the city centre being cordoned off, and housing damage assessment.

*"After the initial response we moved forward. The assessment of the damage to the homes took a considerable amount of time. We tried to identify the most vulnerable both in terms of vulnerability as a result of the damage to their home and vulnerability in the terms of the person itself (...)
Initially there was a big support among neighbourhoods and local communities, people helping each other. As time moved on, this support tended to dissipate and some have been able to move on with their lives much quicker than others, they moved away from a sense of despair, , while perhaps for a minority there are issues even now, they are stalled in this situation."*

One of the points that were raised concerned the assessment phase, during which government agencies were trying to figure out the type of damage that occurred and how proceed with the repair and reconstruction. However, many interviewees were barely able to recall when this event occurred and when the process was concluded. As an example, some interviewees mentioned that the city centre was cordoned off for a long period and the cordon slowly shrank, but they could not recall when the city centre was finally reopened.

"We have had the city centre being cordoned off and it was cordoned off for...I can't remember when it has been re-opened but it was gradually made smaller and smaller."

The definition of a reconstruction period was made more difficult by the aftershocks that struck the region over and over again, which hampered the resolution of insurance claims and also the reconstruction planning.

"For us we entered in a recovery mode 6 to 8 months after the earthquake. And we are not talking about a single event but a series of events. So it's difficult to us to say that we ended one part of the phases and start another one because it was transitioned."

According to the interviewees, there was an extended demolition phase, which lasted several years, during which damaged buildings were demolished. However respondents agreed that Christchurch and the whole Canterbury region were now entering the proper reconstruction phase: new buildings were being constructed and many people, having had their insurance claims sorted out, were able to move on with their lives.

"Now we know what is going on with the land, and we have a vision for the city and we are moving away from deconstruction and demolition into rebuilding."

Broadly speaking, the reconstruction phase was depicted as a period in which time was bloated and it became marked by long waits and few relevant events.

"The Red Cross recovery was launched in July or August 2011. There haven't really been specific stages but more a transition."

THEME 2: MORE THAN THE TYPES OF INFORMATION AND
COMMUNICATION CHANNELS ARE THE COMMUNICATION MODES
THAT CHANGE OVER THE RECONSTRUCTION PERIOD

Questions 2 and 3 looked into the types of information provided to the public and the communication channels used during the reconstruction period and whether and how they changed over the time. Five codes were identified that defined this theme:

Type of information refers to the types of information provided to the public over the reconstruction period.

Type of channel refers to the types of channels used to provide information to the public over the reconstruction period.

Change in information refers to how the information changed over the reconstruction period.

Change in communication refers to how the communication changed over the reconstruction period.

Communication targets refer to the destinations of communication.

As the respondents were not able to identify reconstruction stages clearly, it was also difficult for them to report on the changes that occurred over time. Government officers advocated that reconstruction communication should differ from communication during response and early recovery in terms of how the communication was conducted rather than of its contents and channels. Respondents mentioned that the early phase of recovery involved more mass communication about what was going to happen to

the city, including future urban development plans, environmental risks, the likelihood of aftershocks, how the land was to be re-zoned, and how the damage assessment to the residential properties was to be conducted. Communication aimed at informing people about the type of damage that resulted from the earthquake, the new agencies that had been established and their functions (especially about CERA and SCIRT), and how to protect their social and psychological well being. For example, campaigns such as “All Right?” were set up to support public mental well being and educate people to take care of themselves. As time went on, communication modes had to shift from mass communication to interpersonal communication, namely to a communication customised and targeted to individuals or groups of individuals.

"The information moved away from a community base to an individual base: me, my family, my EQC, my insurance company and how I live."

People in Canterbury have quickly become experts of earthquakes and familiar with technical jargon. As a result, questions and information being asked by the public became more and more specific to the issues that people faced in their homes, neighbourhoods or insurance claims.

"The rebuild thing we are talking about being quite mass, we had to tell people what our agency was and it was mass communication but as we go on the people are dealing with issues that are even more complex and our communication is becoming more tailored and targeted...so we go from mass to very individual."

As an example, the communication modes of SCIRT changed from “who we are“ and “why we do this” to “what is the impact of these repair works on your daily routine?”

Communication targets have become more specific. For example, many communication campaigns about public health during the reconstruction phase have targeted general practitioners (GP), who are considered to be the main point of contact between vulnerable people in need of assistance and mental health services. Another communication practice that seemed to have taken ground in the reconstruction was to collaborate with community based groups and to harness their private communication channels (for example their Facebook pages) in order to amplify official messages.

"We have a list of key-stakeholders we communicate with. A thing that has changed over the time is the communication with community groups because a lot of these groups didn't exist prior the earthquake. We can communicate with them and they have Facebook groups through which they can share information."

"We have direct relationships with community groups and they publish information on their Facebook page. We don't do it directly."

Working alongside community-based groups enabled communications to be more focussed on the needs of specific social groups or neighbourhoods. Other groups frequently targeted included foreign workers involved in repair works across the city and vulnerable groups. Despite this, and in consideration of the wide area and population affected,

much of the reconstruction communication was addressed indiscriminately to the whole public.

Communication channels remained stable over the reconstruction period, with a clear preference given to public meetings (face-to-face communications) and printed material. Interviewees also frequently mentioned on-line websites and radio as communication channels that were used to convey reconstruction information. Social media use evolved over the reconstruction period, in that some agencies did not have an on-line presence prior to the earthquakes but adopted social media soon after. During the reconstruction period, social media rose to prominence as additional outreach channels. One of the agencies mentioned that due to the need to spread information and updates quickly, in the beginning it was not possible to engage with the public using these tools, something that could instead be done in the long-term reconstruction phase due to the communication being more focused.

THEME 3: RECOVERY AGENCIES HAVE TO DEAL WITH EXPECTATIONS OF RESPONSIVENESS IN A CONTEXT OF HIGH UNCERTAINTY AND INFORMATION OVERLOAD

Question four prompted the respondents to identify communication issues experienced during disaster reconstruction and how they have changed over time. Three codes were identified:

Communication problems refer to the communication problems encountered, which can be divided into two sub-themes: (a) related to the agency and (b) related to the people.

Information overload refers to information overload during reconstruction

Importance of face-to-face communications refers to how face-to-face communications helped to overcome barriers.

The interviewees made it clear that recovery agencies found themselves providing information to the public in a highly stressful environment. While people affected urged officials to furnish responses to individual and community issues, the answers were not always available to the government agencies. Communicating uncertain information was risky and so it was explained to the public that this information was not yet fully available or was not clear. Government officials also found that they had to learn technical aspects they had never dealt with before. Communicating information while learning how to drive a recovery process was challenging. Likewise, it was challenging to communicate technical information, to present the available options and to inform the public about decisions taken by other government agencies over which recovery management officials had little or not control.

" The overarching barrier that we have encountered from the beginning is not having all the information they wanted as soon as they wanted it. Whether was about the land or the rebuild or the central city. Or another bit wanted a piece of information but we were still gathering technical information or no decisions had been made or for whatever reason we still didn't have it...and I think this has been a real challenge...this has been an overarching issue...I think we could have done a better job at being transparent about the fact that even though

*we didn't know the answer, we knew what was the question
and we were working on it"*

*"About the communication issues, the earthquake was so huge and
so many thousands of people had queries and issues very difficult
to answer... EQC to customer communication was incredibly difficult
and there was some dissatisfaction about this fact and this was
complicated by the fact that the earthquakes generated problems
that couldn't be answered straight away. A lot of them had to do with
insurance issues, which makes it frustrating for people that ended up
asking for something. There were some questions and we simply
had no answer to give people on that and that was obviously not
very satisfactory".*

As time wore on, frustration and anger grew among people. Having to deal with dissatisfied and distressed made communication more difficult. As an additional communication barrier, the reconstruction context was flooded with information from various recovery agencies. This increased people's difficulty in retaining and interpreting the information provided. Bearing these issues in mind, recovery agencies in Christchurch produced joint publications to ensure that messages were getting across consistently. As an example, the initiative 'Future Christchurch' produced several publications jointly signed by Christchurch City Council and CERA.

*"We have Future Christchurch website that we have operated in tandem
with the Government where we provide information about the progresses.*

We have Twitter account and also publication in collaboration with the Government."

In this context, public meetings were considered by government officials to be the most appropriate and effective means of communication, as they provided residents with the opportunity to ask questions on individual recovery issues and obtain information quickly and without the risk of misunderstanding. Printed materials were also relevant, as, in the opinion of the interviewees, people needed something that they could take away without the need to retain all the information in their minds. Keeping people engaged over an extended period and reaching out to vulnerable groups and ethnic minorities (which were often the hardest to reach) were two more communication challenges that were frequently mentioned by the interviewees.

THEME 4 SOCIAL MEDIA HAVE POTENTIALS TO ENHANCE COMMUNITY ENGAGEMENT BUT THEY CAN ALSO HEIGHTEN COMMUNICATION ISSUES

Question 5 looked specifically into social media usage during disaster reconstruction and assessed barriers to communicate via these platforms. Four codes were derived from this analysis: -

Social media usage refers to how social media have been used during the reconstruction phase.

Examples of two-way communication refer to examples in which social media were used for two-way conversations with the public.

Problems of communicating via social media refer to the problems experienced in communicating via social media.

Problems in two-way communication refer to the problems experienced in two-way communication.

Interviewees recognised that social media could be formidable tools to reach out to a broad audience, engage with a specific social group (e.g. young people) or collect citizens' queries and opinions. However, the way government agencies in Canterbury used social media remained unidirectional. In the greatest number of cases, interviewees admitted that Facebook pages or Twitter feeds were used to promote website contents, inform about achievements and recovery news or as an additional outreach channel. At the same time, they advocated that more could be done to use these tools for meaningful community engagement.

"During the recovery we used social media mainly for monitoring and providing information that they can use on their website, and on their Facebook page. We have tried to keep positive about what we were doing and to show progresses. We haven't done a two-way communication, it's of small scale and I see that many governmental organisations have their Facebook page but it's mainly to give out information or if there is a direct question, there is an answer but we could still do far more about really engaging with the people who are reading the comment."

"But mostly we use social media to point people to the news page, there is often just a link to the web page."

In some cases, recovery agencies harnessed on-line groups to spread information and expand their outreach potential. In addition, some examples could be identified of social media use to engage people in co-creating recovery plans or public campaigns.

"When you think about social media, we are using it mostly for monitoring what other groups are saying and doing. To announce that we are going to have a meeting, we put it on the community groups' social media account."

"We also used them for two-way communication. So we were wondering whether to do a certain thing and we asked people on Facebook or we asked people to be interviewed and tell us what our Facebook page meant to them."

"We also used social media to build some community relationships. Especially in the last couple of years we have been able to talk about, this is an issue for the residents, how do we communicate this? And actually work with the community to co-create what we are going to deliver, to say we think we are going to say this, what do you think? Getting people on the table from the beginning and be co-creating the communication. I think this is powerful..."

On the other hand, social media were seen as able to heighten some existing communication issues during reconstruction. For example dealing with frustrated and distressed residents was even more difficult on social media because people were inclined to see these platforms as way to express their dissatisfaction towards the recovery agencies.

"It wasn't a constructive channel for us at that time because there is a lot of frustration in the community and for some people that was the only way to get it through. So there was a lot of negative and angry comments and posts and so forth and also it was incredibly laboured."

Managing distressed people was even harder due to the high risk of misunderstandings and the problems in initiating and sustaining a conversation over social media. Furthermore, people often used social media to present individual issues that could not be discussed on a governmental public profile both for privacy reasons and because individual circumstances were not relevant to the whole audience. Interviewees also mentioned resourcing as another challenge that prevented them from using social media for community engagement during the rebuilding. Monitoring social media and responding to queries was time consuming and the cost of hiring personnel trained in dealing with frustrated people was too high to sustain.

"One of the main barriers is resources because it's time costly and it takes much personnel and they (editor's comment: other government agencies) see social media as something that others have to do, they see all the risk attached to it. People can give their opinion and I think that most of them just see social media as a way to moan and they really don't see it as a channel to have a good engagement."

One government officer mentioned that social media are more useful when one has to reach a broader audience. Conversely, recovery communication must be targeted according to individual needs.

THEME 5: SOCIAL MEDIA ARE A VENUE FOR PEOPLE TO CONNECT
AND SHARE THEIR ISSUES DURING THE RECOVERY PROCESS.

Lastly, interviewees were asked about what they thought the role of social media had been during the Canterbury earthquakes reconstruction. Given that the responses largely converged, only one code was identified and named as "*Social media as a venue for information sharing*".

In the opinion of the interviewees, social media represent a place for affected residents to share recovery information, to form on-line discussion groups and to support each other while dealing with recovery issues.

"The role of social media during the recovery has been of support, people could gather together and find each other and share information and form communities; a lot of new group came together. Before you could see people protesting on the streets, now they meet in Facebook. For example we had to build a new infrastructure and one group didn't like it and they made their own search, their own website and residents' group. You normally go on the street, now they create their own website, they still go on the street but social media make easier to group together and get more people there."

"I think that social media have provided a lot of support, people have felt they are not alone, that they can talk to other people, share their opinion and concerns. A lot of information sharing. Social media have provided a lot of information not necessarily accurate but a lot faster than what agencies and businesses could provide."

and 29 for the off-line questionnaire.

Table 5.4 compares demographic characteristics of on-line and off-line respondents.

Looking at the table, the demographic characteristics of the two groups appear to be comparable. Arguably, this can be attributed to the fact that off-line responses were gathered *during public meetings and from community representatives*, therefore reaching out people who were already engaged. For the off-line questionnaire, 69% of the respondents used social media every day, and 10.3% never, several times in a week or several times in a month. The on-line respondents were almost all frequent users with 83.3% using social media every day and 10.7% several times in a week. The underrepresentation of marginalized social groups such as ethnic minorities and people with low levels of income or education contributed to the large presence of social media users. In order to verify the coverage of the sample in terms of geographical area, respondents were asked to state the neighborhood they lived in. Figure 5.20 shows the geographical coverage of the responses. The largest contingent lived in Christchurch and its suburbs. Interestingly, many of the respondents resided in the eastern suburbs of the city (e.g. Mount Pleasant, Sumner and New Brighton), which were also the areas most affected by liquefaction. In the first part of the questionnaire, respondents were asked to indicate type of information, source of information and means of communication. With regards to the type of information, damage assessment, housing and infrastructure reconstruction, traffic plans and funds or refunds were the four most frequently chosen options. Respondents also wanted to receive information about psychosocial

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support, environmental risks and community groups.

Table 5.4 Comparison of the demographic characteristics of on-line and off-line respondents in Canterbury

	ON-LINE	OFF-LINE
Gender	Females 71.3%	Females 48.3%
	Males 28.7%	Males 51.7%
Relocated after the earthquakes?	No 83.9%	No 93.1%
Level of education	University Degree 55.3%	University Degree 60.7%
	Vocational College 24.7%	Vocational College 21.4%
Living in	Main Urban area 80.7%	Main Urban area 79.3%
	Minor Urban area (between 1,000 and 9, 999) 8%	Minor Urban area (between 1,000 and 9, 999) 6.9%
	Secondary Urban Area (between 10,000 and 29,999 residents) 9.3%	Secondary Urban Area (between 10,000 and 29,999 residents) 10.3%
Ethnic Group	Nz European/Pakeha 97%	Nz European/Pakeha 82,4%
		Other or mixed 17%
Household Income	Less \$35 17.3%	Less \$35 16%
	\$35K-\$50K 12%	\$35K-\$50K 20%
	\$50K-\$100K 38%	\$50K-\$100K 32%
	\$100K-\$140K 19.3%	\$100K-\$140K 20%
	Over 140K 13.3%	Over 140K 12%
Age	Range 20-75	Range 25-74
	M=51.96 SD ±11.2	M=46.48 SD ±14.7

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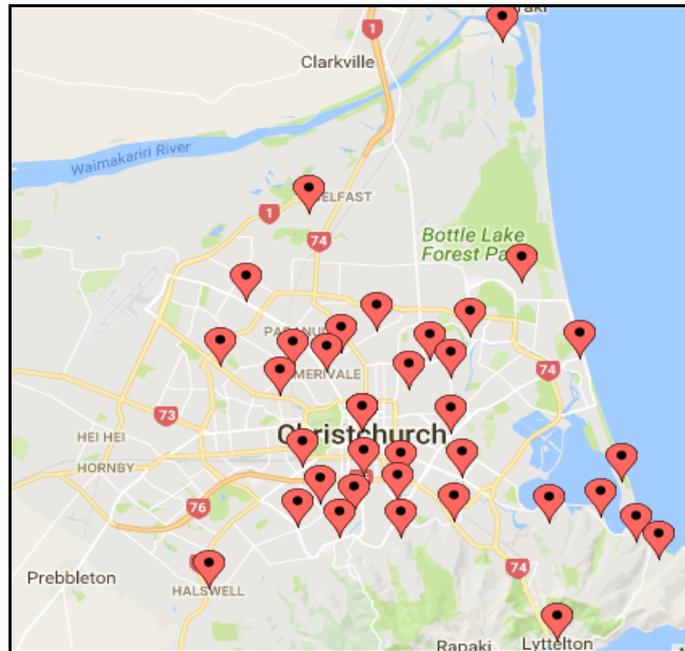


Figure 5.20. Areas of residence of the survey respondents in Canterbury

The least ticked included information about education and health services, donations, debris management and business recovery. Females gave preference to information about psychosocial support $\chi^2(1)=5.32$ (Yates continuity correction), $p<0.05$, $\phi=0.012$. People living in rural areas with less than 300 residents wanted to receive information about environmental risks more than people living in major urban areas with more than 30,000 residents, and secondary urban areas of between 10,000 and 30,000 residents $\chi^2=13.52$; $p<0.05$, Cramer's $V=0.009$). They also showed more interest in information about debris management than did residents of bigger urban areas ($\chi^2=17.17$; $p<0.05$, Cramer's $V=0.002$).

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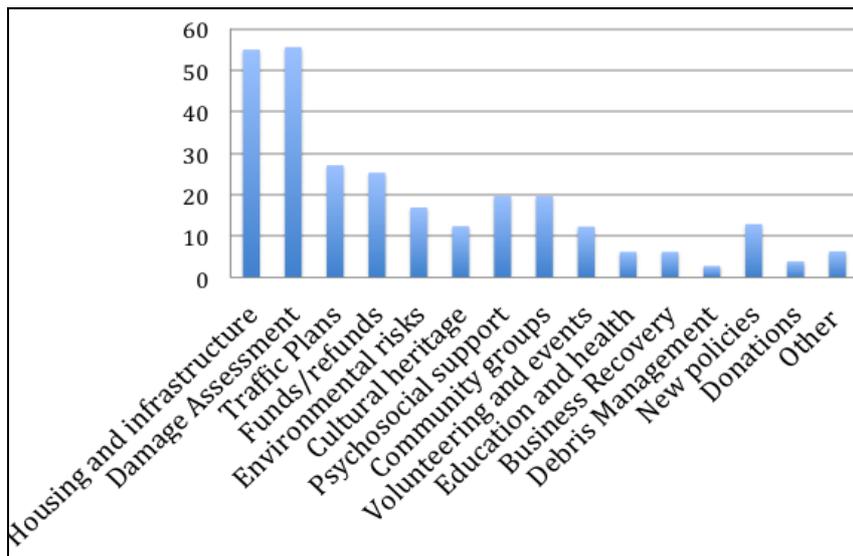


Figure 5.21. Information sought during the reconstruction phase following the Canterbury earthquakes

As far as information sources were concerned, respondents selected EQC (76.3%), Christchurch City Council (73.9%), CERA (51.4%) and repair companies (31.6%) above all the others. SCIRT (28.2%), Ministries (20.3%) and Environment Canterbury (19.8%) were considered relevant as well. The District Health Board was selected by 12.4% of the respondents and the District Council by 10.2%. Interestingly, about 17% of the respondents declared that they looked up information from other sources, notably on-line Facebook groups, community associations and insurance companies. Female respondents were more likely to seek information from CERA $\chi^2=5.55$ (Yates continuity correction), $p<0.05$, $\phi=0.012$ while people with an income between NZ\$35,000-50,000 were more likely than those with higher incomes to seek information from the District Health Board ($\chi^2=11.04$, $p<0.05$, Cramer's $V=0.026$).

Similarly to the Emilia-Romagna case study, data concerning means of communication and social media usage were analyzed separately in order to highlight potential biases due to the different modes of administration of the questionnaire. The responses “at least once a week” and “at least once a month” were combined to rank the channels that were most heavily used. As shown in Table 5.5, on-line communication means such as websites and social media were massively adopted in order to gain information about reconstruction. Interestingly, on-line respondents proved to adopt a wider range of means to look for information than off-line respondents. For the on-line survey, respondents with a university degree were more likely to adopt the Internet to look for information ($\chi^2=8.33$ $p=0.040$). A Kruskal Mann-Whitney U test confirmed that respondents who held a university degree (Mdn=3) were more inclined than those with a vocational/technical college (Mdn=2) to use the web ($U=1079$ $p=0.005$, $r=-0.25$). Social media were far more used by people in the age range 46-55 (Mdn=3) compared to older people (over 56 years old) (Mdn=2) ($U=1119.5$; $p=0.002$, $r=-0.29$) and younger people (between 36 and 45) (Mdn=2) ($U=355.5$, $p=0.003$, $r=0.35$).

Printed material and telephone were still considered essential, whereas face-to-face communication was the least ticked channel for both the on-line and off-line surveys. For the on-line survey, people with an income between NZ\$50,000-100,000 were more likely to make use of paper material than people with higher incomes (over NZ\$140,000) ($U=75.5$, $p=0.002$). The same was true for older people (over 56 years old) (Mdn=2) in comparison with younger respondents (less than 35 years old) (Mdn=1) ($U=174$; $p=0.000$ $r=-0.41$) and with people in the range of age 46-55 (Mdn=2) ($U=1195$; $p=0.017$, $r=-0.22$). Older people (over 56) (Mdn=2) were

also more inclined to gain information from television than were younger respondents (between 36 and 45) (Mdn= 0.50) (U= 478 p=0.048 r=-0.21) and those between 46 and 55 (Mdn=1) (U=1182.5; p=0.023, r=-0.21). A striking percentage of people stated that they used television and radio to receive updates about reconstruction, although these two channels remain among the least used.

Table 5.5 Communication means used to seek recovery information. The responses “at least once a week” and “at least once a month” were combined to highlight the most used channels

	On-line	Off-line
Web	69.3%	67.8%
Social media	76%	55.5%
Face2face	23.3%	18.5%
Printed	59.3%	48.1%
Phone	48.7%	32.1%
Television	44%	25.9%
Radio	42%	29.6%

Table 5.6 offers an overview of social media usage and barriers to use by the citizens surveyed. The largest part of the respondents adopted social media during reconstruction to read updates and information. Interestingly, off-line respondents proved to be more inclined to organize activities with other residents via social media. This finding may be attributed to the fact

that off-line respondents were mostly community-based groups' representatives, arguably with a greater inclination towards social mobilization. Conversely, on-line respondents were more active in information sharing activities about reconstruction efforts. In the off-line survey people over 56 years old proved to be less inclined to organize civic protests with other residents via social media than were younger respondents ($\chi^2=8.92$ $p<0.05$ Cramer's $V=0.030$). The percentage of respondents who used social media to contact or to collaborate with recovery officers was comparatively irrelevant. Findings that concern barriers to communication via social media clarify the reasons as to why this is the case. Among the main barriers, on-line respondents mentioned lack of trust in the authorities, the belief that the authorities did not use social media to communicate about reconstruction and concerns over privacy. Off-line respondents gave similar answers but selected less often lack of trust in the authorities as a communications barrier. Rather they stated that they preferred to use social media for other purposes. Lack of time was a relevant impediment, especially for off-line respondents. Respondents who lived in a rural area were more likely than those living in a major urban area to tick lack of IT skills as a barrier $\chi^2=21.51$; $p<0.05$, Cramer's $V=0.000$. However 13.3% of the on-line respondents and 21.4% of the off-line respondents declared they did not have any problems in communicating. Those who ticked the option "other barriers" manifested a deep distrust of government agencies. This is evidenced by responses such as "Agencies use social media to build their profile or brand", "The hard questions are not answered", "Discussion options from authorities on social media are often too generic to be of much help," and "Social media is seldom a two-way process with authority, nor is it private".

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Table 5.6. Overview of the motivations and barriers to social media usage by citizens

I have used social media during PDR:	On-line	Off-line
To read information about reconstruction	88.6%	84.6%
To post information about reconstruction	51%	26.9%
To organize activities and protests with other residents	18.1%	42.3%
To contact an authority	4.7%	15.4%
To collaborate with authorities	2.7%	0%
To have a two way conversation with the authorities	0%	3.8%
I have not used social media for recovery communications	4%	7.7%
I have not used social media to discuss with authorities during PDR because:		
I have concerns about privacy	30.7%	27.6%
I prefer using social media for other purposes	18.7%	25%
I don't trust authorities	43.3%	13.8%
I think that authorities do not use social media to communicate about PDR	30.7%	20.7%
I have no IT skills	1.3%	7.1%
I have no time	11.3%	25%
I had no problem	13.3%	21.4%
Other barrier	13.3%	13.8%

These responses indicate that people looked for information on social media from other residents rather than from the authorities. One respondent stated: *“Social media is better for information than for discussion. One councilor is great, posts a lot and invites discussion which I participate in; would like to see it used more.”* Therefore, it does not come as a surprise that the largest number of respondents in the survey (78.6%) declared that they did not use social media to have a two-way conversation with the recovery agencies.

Facebook was by far the most widely adopted social media platform for recovery-related communications and conversations (79% of the respondents), followed by websites created for the reconstruction (31%), forums (19.4%) and Twitter (14.5%). A difference emerged in the use of blogs according to income ($\chi^2=14.69$, $p<0.05$, Cramer's $V=0.005$). People with an income of NZ\$35,000-50,000 were more likely to adopt this type of social platform.

A further piece of information is given by the responses about attitudes towards the use of social media for communicating with recovery agencies (Figure 5.22). Respondents to the survey appeared quite engaged in on-line discussions about social and political issues. Although many showed a general awareness of the importance of social media technology for discussing recovery-related issues with recovery officials, the large majority did not think that this tool was useful for them for this purpose.

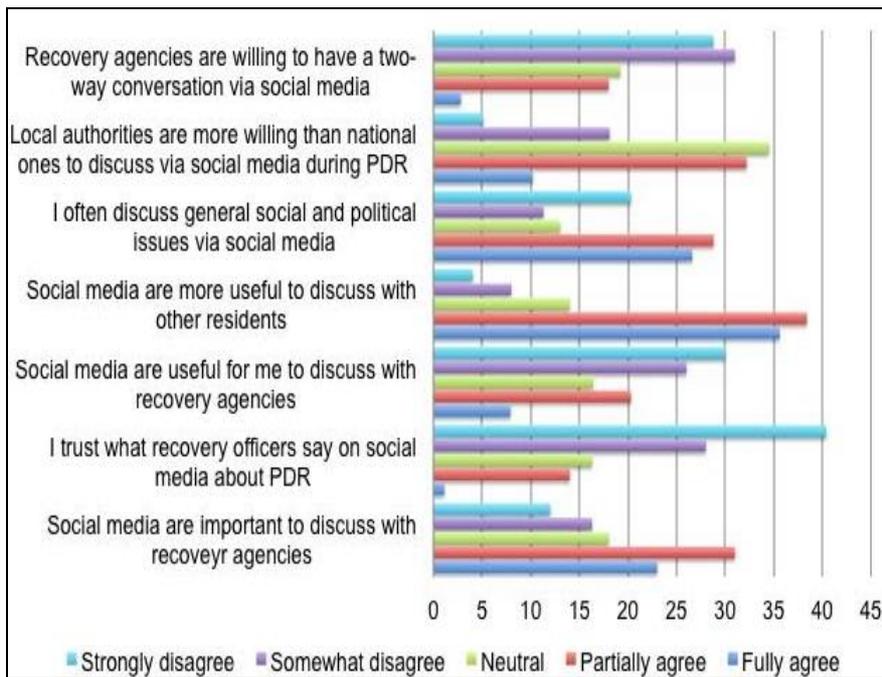


Figure 5.22 Attitudes towards the use of social media for communicating with recovery agencies

Instead, they thought that recovery agencies were not willing to discuss via social media and showed distrust of what recovery officials said about reconstruction. Conversely, respondents argued that social media were more useful for sharing information and organizing off-line activities with other residents. Local authorities were believed to be more willing to engage with residents via social media than national ones, although the percentage of uncertain respondents was high for this question.

Thematic analysis of interviews

Thirteen interviews with community group representatives were collected in August 2015, eleven face-to-face and two via Skype. For comparison

purposes, the interview guide was designed to investigate similar research areas to the ones examined in the interviews with government officials. The interviews were audio-recorded, transcribed and analyzed by the means of thematic analysis. The following themes were identified and are henceforth described.

THEME 1: CENTRALISATION OF THE RECOVERY MANAGEMENT LEADS TO PEOPLE'S DISENFRANCHISEMENT AND DISTRUST TOWARD THE AUTHORITIES

The first area unveiled by the analysis concerns the management of the recovery process and the feeling of distrust and disenfranchisement. Four sub-codes were identified.

- *Centralisation of the recovery* refers to the centralisation of the recovery management by national authorities.
- *Conflicts between local and national government* refers to the conflicts emerged during the reconstruction period between local (City Council) and national government over the recovery management and key decisions.
- *Share an Idea* refers to the public consultation initiative "Share an Idea" run by Christchurch City Council in May 2011.
- *Distrust in government* refers to the feeling of distrust in government and recovery management.

According to the opinions of the interviewees, national government, represented by CERA, centralised the recovery management and excluded citizens from any important decisions taken about the future of the city. In

the words of the interviewees, CERA and other national government authorities such as EQC were presented as distant entities, often having their employees and offices in Wellington far away from the Christchurch and therefore unable to understand the local context. Opinions gathered through formal interviews and field notes confirmed that the centralisation trend was already underway before the disaster, but that the earthquake heightened and made it more evident, giving an excuse to take away power from local agencies.

"What has gone on here in terms of communication between governments and citizens is symptomatic of something we are seeing globally around the issue of democracy, lack of democracy, capitalism going crazy, the role of citizens diminished, the right of government to assert itself overrun about the desire of the population. I think this is a global problem but in a disaster you see it very clear; it heightens these issues. These trends were present in New Zealand prior to the earthquake but the earthquake causes a heightening of all of that and you can see things happening much more clearly than you could see in a time that it's a time of stress."

A locally led recovery was hindered by the fact the Christchurch City Council agenda for the future urban revitalisation planning was replaced by the priorities set by central government, which benefited private companies more than the affected population. In this regard, some interviewees expressed more or less explicitly the opinion that the management of the recovery after the Canterbury earthquake was a form of 'disaster capitalism' (Klein 2008; Loewenstein 2015).

"A lot of people participated and were excited but then the government came and said: "this is not good enough, we are going to give you a blue

print for the city, you don't know what you're talking about" and you can see that there were a lot of political interference. And it's evident a "disaster capitalism": after five years if you look at the buildings that are coming up, they are private buildings."

In their opinion, the conflict between local and national authorities over the definition of the priorities for the city recovery made it unclear for some people how the recovery tasks and responsibilities were split between the two agencies.

"A lot of people that work with CERA are not from Christchurch, people are making decisions in Wellington about things that Christchurch risks, we have a little representatives.. Do I think there is a difference (editor's note: between recovery management by local and national government)? Yes there is, and the government has argued that had to come to that control because the local government was incompetent but that is speculation."

According to the people interviewed, the fate of the "Share an Idea" initiative was emblematic of the centralisation of the powers in the national government's hands. The initiative was launched a few months after the earthquake of February 2011 by the City Council in order to seek citizens' inputs and views on recovery priorities and generate a vision for the Canterbury recovery to be translated into the Central City recovery plan produced by the Council. All the interviewees regarded "Share an Idea" as a relevant and positive initiative able to stir enthusiasm and generate insightful thoughts about the future of the affected area. However the ideas gathered were not taken into consideration in the final blue print produced by CERA that set out the agenda for the rebuilding.

"After the earthquake, the City Council launched "Share an Idea" campaign and they got many ten of thousands Canterbury citizens to turn up and put on an idea about how they wanted their city to look like. When the Government came along with CERA, they took that and said what they were going to do. So people thought: "Hang on, they asked for our opinion and engagement and then they just ignored that, and did just what they wanted". This seemed to be a betrayal."

The failure of translating consultation campaigns like 'Share an Idea' into actual engagement of citizens in the definition of recovery plans was often mentioned by the people interviewed as the main reason for the sense of disempowerment and disenfranchisement. Why should one trouble himself or herself to participate in consultation campaigns if his or her opinion is not ultimately heard? This sense of disenfranchisement also affected the way in which the communication and information disseminated by recovery agencies was perceived. The widespread opinion among the people interviewed was that government agencies were only concerned about informing residents about the decisions that had already been taken, without offering any meaningful engagement in the decision making process. Consultation campaigns were perceived as something that recovery agencies had to do to complete their checklist rather than a critical element of the generation of effective recovery plans.

"It is not meaningful engagement, it is a just a process they have to go through, it's just ticking boxes: consultation with community "DONE". They don't really want to listen to what people say and over time you had some much, "tell us what you think, tell us what you think, tell us what you think" and you think "Well, did they listen here? No. Did they listen here? No. Did

they listen here? Maybe they did on this one but...people become cynical about these processes and stop participating."

Despite many campaigns being undertaken, the perception was that recovery communication was largely one-way, with residents being informed about critical decisions after that the agenda was already set. As a result of this, information provided was perceived as distorted and stage-managed and, therefore, not trustworthy.

"And the second thing that come with that is that government changed the information we were given to become much more restrictive, much more protective of the information. The information became managed. To give you an idea even now the budget for the public relations at the central government involved in the recovery is doubled this year alone. And the government has changed now to manage the information: this is looked as politically acceptable, it is acceptable to the community. It has to do with politics (...) That is why we have the community groups as a hub to provide alternative sort of information."

THEME 2: THE RECOVERY IS A TRANSITIONAL PHASE WHOSE DEFINITION DEPENDS ON THE INDIVIDUAL CIRCUMSTANCES

The second theme emerged concerned the definition of recovery. Four sub-themes were identified, as follows: -

Definition of recovery refers to problems and ways to define recovery after the Canterbury earthquakes.

Turning points refers to the turning points during recovery after the Canterbury earthquakes.

Phases of the recovery refer to phases of the recovery process.

Current recovery phase refers to the recovery stage currently experienced.

As for the interviews with recovery officers, residents interviewed expressed the opinion that the definition of recovery was highly dependent upon individual circumstances. Some of the interviewees living in the eastern suburbs mentioned that they were still in the emergency phase, or that they had only recently come out of it, and that they have been waiting years to see their houses repaired or to settle house or land damage claims.

"I think that for most people that is a linear phase. The second thing is that it also depends on whom you talk to: if you are still living in a broken house and suffering, you're still in an emergency phase. If you are in the other part of the city and your house has been repaired, your perception is being in a recovery phase. So it depends on the person and the circumstances. You can't say that the entire city is on the recovery and I also I think that not even in the beginning the entire city was in an emergency phase. It depends on your circumstances..."

When asked about the phases of the recovery process after the earthquakes, interviewees identified clearly the response and early recovery phases and indicated 'Share an Idea' and the publication of the Blueprint as major turning points. After this, there was a long transitioned period when attempts were made to define a vision for the city's recovery,

public consultation campaigns were run and damaged buildings were demolished. From the words of some interviewees, this period of demolition was marked by long waits and by a general feeling that little was moving in terms of reconstruction.

"The recovery was a linear process. There was like the emergency and then they decided to start the recovery. I can very clearly identify phases of emergency and immediate recovery, when they started to clean the roads and there was the cordon. And then everything was really very slow, you had the impression nothing was changing. It was about demolition so we had this feeling at least for two years that nothing was changing from a building perspective...it was a long period and when we came back here now."

"The recovery started very slowly and part of that was because of the on-going earthquakes (i.e. in June the cliffs fell). It just seems that it's taking a long time, we have still our roads closed, we still don't have a supermarket, kinder gardens are gone, services have not improved necessarily for the better. It has been a very long process and it's probably being exasperated by the fact that we have started the rebuilt of our house just now, four years later."

In August 2015, the widespread opinion was that the proper reconstruction of Christchurch had started only a few months before. Thus, many people were able to resume their normal lives while few others lagged behind.

"We started to have the impression that something was moving forward with an actual rebuild just few months ago. I have been in the city centre several times before and it just seemed to be that everything was being

demolished but now you can see that they have started the actual rebuilding."

Apart from Share an Idea, the decision to cordon-off the city centre and then the slow reopening were mentioned as turning points in the Canterbury recovery. However the recovery process was generally depicted as a slow transition, and not one that was clearly marked by turning points.

THEME 3: INFORMATION SEEKING DURING DISASTER RECONSTRUCTION RELATES TO INDIVIDUAL ISSUES AS WELL AS TO GENERAL RECOVERY PLANNING

The third theme identified had to do with the type of information and means of communication, and the potential evolution of these during the recovery process. This theme is formed by four sub-themes.

- *Type of information* refers to the type of information sought.
- *Type of communication* refers to the communication channels and modes.
- *Change in information sought* refers to the changes in the type of information sought.
- *Change in means of communications used* refers to the changes in the type of communication channels used.

Interviewees regarded information both at the individual and the general levels as relevant during disaster reconstruction. People were interested enough to seek information about their individual claims, how the land re-zoning would affect their property and neighbourhood, and about the criteria for damage assessment and housing reconstruction. At the same time, they wanted information about recovery plans, what the authorities intended to do for community revitalisation and why certain decisions were taken. They also wanted to be informed about increased flood risk, land damage and land remediation.

"Well, we were looking at if our house would have been red zoned and we would have been arbitrary evicted. We wanted information about the stages of our land and we wanted to understand if we were forcefully removed from the land and the house. That was one of the information we were looking for...eventually we got them...a next set of information would be...so we were talking about the government, the next question would be if we have to stay what are our obligations regarding our property and the rebuilding, what are the government criteria about how the house should be reconstructed and to what standards...what does it mean for infrastructure, if the infrastructure had failed we wanted to know what the government planned to solve the infrastructure. And the third thing what information will the government give us about the revitalisation of our community."

"I looked for personal information about my own property, applying to the official information Act to find out what kind of information the authorities held back about my own house."

In particular, questions were asked that appeared increasingly technical and were made by knowledgeable individuals rather than passive consumers of information. One interviewee declared that he looked for information about the translation of recovery into actual laws. Others consulted official documents to figure out how crucial decisions for the recovery were made, while others directly contacted government officers to contest the validity of hazard maps that provided information that conflicted with the official ones.

"I was particularly interested in information like why they made a particular decision. You never got this information from the government because they are particularly closed and they never mention why they made a particular decision. Why did they put CERA to respond to this earthquake? This sort of communication is missing. I also looked for information like funds available, costing, why did they choose these projects. We had 40 billion dollars to spend here, why did you pick up these big projects?"

The framework that came out of the interviews depicted residents as active agents in the production of recovery information and as knowledgeable individuals. Two interviewees expressed the opinion that the information coming from governmental sources had diminished during the course of the reconstruction. In addition, some interviewees stated that the information provided by government agencies was perceived as increasingly more distorted and therefore less trustworthy. For this reason, many preferred to receive information via social media from other residents.

"We primarily used social media: people asked questions and some of us that had the answer provided it., Sometimes there are meetings where

everybody gather together, sometimes there are legal groups that are formed. For instance, I held residential meetings in my house where we invited forty or fifty families so the neighbours came together and decided on certain things. So you got localised physical meetings and you have social media and all of that involves sharing information."

"I have looked for information from the council, CERA, Ministry of Social Development, Ministry of Parliament office, NGOs.. I have looked for information on Twitter and Facebook both from NGOs and government agencies."

Information was sought through official websites, email correspondence, public meetings and telephone conversations and sometimes through social media. When it came to receive information about recovery, face-to-face communication was considered essential. Furthermore, interviewees stated that being able to create one-to-one relationships with one or more officials in the recovery agencies was the fastest and easiest way to obtain accurate information about disaster recovery.

"I have used the Internet and direct contacts with councillors to know what's happening. With Internet I mean websites and Facebook (...). Also many councillors spoke at events like coffee and jam, being quite transparent about what was happening, about the situation and what sort of engagement the council was about to do with the public (...) so also face to face (...)."

THEME 4: LACK OF TRUST, COMMUNICATION FATIGUE AND DISEMPOWERMENT NEGATIVELY INFLUENCE COMMUNICATIONS BETWEEN RESIDENTS AND AUTHORITIES DURING THE

RECONSTRUCTION PHASE. CREATING PERSONAL RELATIONSHIPS WITH GOVERNMENT OFFICERS INFLUENCES THEM POSITIVELY.

This theme is made up by three sub- themes.

- *Communication challenges* refers to the challenges encountered in communicating with authorities.
- *“Negative examples of communication”* refers to negative examples of communicators and communication practices.
- *“Positive examples of communication”* refers to positive examples of communicators and communication practices.

The largest number of interviewees saw communicating with the authorities as useless, draining and not worthwhile. In their opinion, despite many consultation campaigns, ultimately residents’ inputs had not been included in any of the recovery plans. The feeling that the voice of the residents would not be heard discouraged people from spending time on any communications with the authorities.

“The positions were closed and communicating with them didn’t seem to achieve anything. And then at a certain point, probably 2013, I stopped attempting to communicate with governmental organisations. The main barrier of communicating with the authorities is that they have fixed views. A sort of attitude: we are sitting here, we are the bureaucrats, we know what we are doing, we have a policy we are following and not willingness to really listen.”

At least two of the respondents mentioned that whilst recovery agencies like CERA have doubled the budget for PR departments, this has not translated into an actual attempt to engage with citizens. The widespread opinion was that the information given by recovery agencies and the attempts at communicating were not sincere or trustworthy.

"The analogy I'm using (...) if you get junk mails in your letter box at home you might have a quick look at it but you just throw it (...). I found a similar thing happening with government information (...) It's like "this is spam", this is managed information, can I read and use it? Can I trust it? Is there anything new? Government will say they sent out emails and printed material to people...so why is that we all need social media to communicating and get information?"

Communicating with recovery agencies was described as exhausting. Interviewees mentioned that they had almost to chase government agencies to receive any information, to ring them several times or engage in long back-and-forth chains of email correspondence. Phone communications were made difficult by the fact that people had always to speak with a different person and email communications were long and extenuating because government agencies often made use of templates to respond.

"The authorities, you have to chase them... EQC, for example. I still have to chase them. We got involved in a group called "insurance Watch" looking at what insurance companies were doing. They all were pretty poor in communicating, just some small ones were good in communicating with clients, but all the rest just left people in a limbo. And you have to ring them up, it's difficult to find out what was going on and it's a point of distress."

Some other interviewees mentioned that finding the right person to speak to within a government agency was one of the main challenges in obtaining recovery information. For this reason, creating direct relationships with trusted government officials was regarded as the key to obtaining accurate information in a fast and easy manner. It is important to note that interviewees also mentioned some positive examples of communication by government authorities. For example, they repeatedly mentioned that SCIRT and 'All Right?' produced effective communications to residents. Some members of Christchurch City Council, especially in the top management, were seen as willing to engage in conversation with residents about reconstruction-related issues. Among these, the Deputy Mayor, Vicky Buck, emerged as being particularly active, especially in social media communications. Two of the interviews mentioned that Roger Sutton, former CEO of CERA was a good communicator.

THEME 5: COMMUNITY-BASED GROUPS, BOTH ON-LINE AND OFF-LINE, SERVE AS INFORMATION HUBS AND BROKERS DURING DISASTER RECONSTRUCTION

This theme consists of only one sub-theme named “*Role of community-based groups*”.

Both on-line and off-line, community based groups were represented by the people interviewed as information hubs that collected recovery updates from official and non-official sources at one point and disseminated them to the wider public.

"I was working in the community in XXX. And I was also actively building residents' associations, support groups. I was also part of the City Council so I was bringing information to the community and from the community."

In other words they brought information to and from the community, acting as a mediator of G2C and C2G communications during the reconstruction process.

"I'm the Editor of the XXX that it started out as an information source where you could go and get help (i.e. which grants and funds were available, where you could find sanitation and other stuff). Then we moved from the disaster phase into the recovery phase. We started to take the information from CERA and the City Council and put them out to people and now every week I do an update on the roads around the city. I go to find information from various websites and put the information out to the people. Sometimes people come to me and say "can you help me? I'm in this position and I don't know what to do" and because of my contacts in the City Council and in other various agencies, I can pick up the phone and say "I have this person, where should I send him?" I would never give them an answer but I can point them in the direction."

Furthermore community groups were active producers of information about the reconstruction, which was then passed on to government agencies. At least three interviewees expressed the opinion that community groups were as capable as government agencies of producing information about reconstruction.

THEME 6: SOCIAL MEDIA ARE EFFECTIVE TOOLS FOR SHARING INFORMATION ABOUT RECOVERY AMONG RESIDENTS, RATHER THAN MERELY A WAY TO COMMUNICATE WITH AUTHORITIES

Three sub-themes emerged.

- *Social media usage* refers to the modes and motivations for using social media.
- *“Negative aspects of social media usage”* refers to the negative aspects of social media usage during PDR.
- *“Positive aspects of social media usage”* refers to the positive aspects of social media usage during PDR.

Interviewees emphasised that residents used social media to receive and share recovery information, discuss their next moves, organise street protests and unmask inaccurate information. In this respect, this technology appears to be more a coordination and communication tool between peers (resident to resident communication) rather than a way to engage in a conversation with the authorities.

“We have our community Facebook page with 110 members. We set it up after the earthquake and that was used to build a sense of community.

People are working and so we tried to make easier for them being connected to the neighbourhood. Having said that, not everyone is on Facebook (because they don’t like Facebook) so you have that but you kind of miss out a lot of people as well. You get more young people using this kind of thing so we use Facebook and then we use emails and also I have a lot of phone numbers of my neighbours on my cell phone and on

*Google groups so I can send text messages to my group contacts
depending on what's happening."*

Social media communications were also a way for people to share news and updates, ask for advice on recovery options and issues, provide and receive emotional support, and maintain a sense of community. Some negative aspects of communicating via social media were also highlighted. Social media were seen as public forums to express opinions, while searching for recovery-related information from authorities occurred through personal face-to-face or phone contacts with recovery officials.

"Because if you want to see the authority and speak with a person you don't need to use social media. It's a quite good channel to getting the information to us but I don't think it is a good way to us to get the information to them or ask questions because it's more a public forum. It's better to find out who you need to talk to and send him an email directly, rather than do it on Facebook."

"I used social media to communicate with our volunteers, to mobilize volunteers for campaigns, to communicate directly with affected people to let them know what was going on, to bring attention about specific elements. I haven't used them to communicate directly with government agencies, I emailed them or talk to them in person."

Interviewees emphasised that recovery agencies may not have the budget and personnel to engage in a conversation with the public via social media and that not everyone is willing or able to use social media.

"For the recovery phase I think that there would be a lot of work involved about trying to be interactive and I suspect that none of the authorities have got the resources to be able to do that."

THEME 7: ISSUES FOR COMMUNICATING VIA SOCIAL MEDIA WITH AUTHORITIES RELATE TO LACK OF TRUST, GOVERNMENT AGENCIES' CONSTRAINTS AND SOCIAL MEDIA FEATURES.

Social media were seen as public forums to express opinions, whereas searching for recovery-related information from the authorities occurred through personal face-to-face or phone contacts with recovery officials. This confirms the opinion already expressed in the interviews with authorities that social media was not an adequate platform to discuss individual issues on recovery-related matters. In addition, information given or communication intentions on social media may be misinterpreted, as many verbal and non-verbal expressions are missing.

"But I think that social media are the wrong place for a meaningful dialogue, they need to be done more one to one, face-to-face because things can be lost in translation, how you write something and how I read it. One to one you can get an answer, you can have appreciation of the communication just face-to-face or talking with someone over the phone because facial expression, intonation of the voice, it's totally different from written word."

Interviewees also acknowledged that engaging in a conversation with residents implies that recovery agencies should monitor constantly the social media outlets, which was a time and resource-consuming task for agencies that had limited budgets and personnel. Furthermore, some agencies had specific constraints about what they could and could not communicate via social media. This made it difficult to build dialogue, especially with communication and PR departments that have specific guidelines to follow.

"Sometime I would use social media but I found this not so useful in dealing with authorities. Because I think social media is a very free way of communicating and it's quite time sensitive so if someone post a question, someone else has to respond. I think that the government hasn't the resources to do that. I think that for the council and CERA you can't speak directly to anyone and when I worked for the city council this was made very clear to us. So I might have information about one specific thing but I can only talk directly to the people over the phone. I can't use social media at all. I couldn't use my personal email account or my personal Facebook account to give away info. So people are scared, they have certain information that want people to know but they are afraid about the way they release it and I understand them to a certain extent. At the moment they haven't worked out how to be good at social media."

In the opinion of the respondents, recovery agencies also have to handle negative comments and expressions of dissatisfaction and frustration that may prevent them from having a two-way conversation. Some interviewees declared that recovery agencies were not interested in engaging via social

media because they saw them as a way for residents to moan about the problems they face in the recovery.

THEME 8: SOCIAL MEDIA HAVE THE ROLE OF PROVIDING
INFORMATIONAL AND EMOTIONAL SUPPORT, AS WELL AS SERVING
AS A COORDINATION PLATFORM FOR AFFECTED RESIDENTS

The interviews showed that social media were used as tools for affected people to express opinions, ask questions and for advice and share recovery-related information. In this respect, the network of like-minded individuals brought together by social media offered informational as well as emotional support.

"Social media has provided an incredible support platform for affected citizens to share information, to support each other emotionally in a process that for many has been very traumatic, it's a way for sharing people's truth, because mainstream media these days give a very slanted view of the events and so social media has been an alternative truth, a truth that many people are living and yet a truth that you don't read in the newspapers."

The feeling of not being alone in facing issues and suffering helped individuals to create emotive connections with other community members in a similar condition. The sense of confusion produced by not knowing timings and procedures of the reconstruction was filled by the knowledge brought along by people facing similar issues. Social media also offered a platform to coordinate off-line activities, mobilise resources and promote

public campaigns. Recovery agencies used this technology to reach out to their audience and spread recovery-related information more broadly. Sometimes, Facebook pages of community groups invited people to participate in consultation campaigns promoted by recovery agencies. In this sense, they also allowed for the amplification of messages on reconstruction matters from official sources.

"Authorities wise is more them to have a channel to update people. For non-authorities is a platform where to start conversation, whether or not authorities want to engage with these conversations. It's easy to do that, but they can still stand alone."

Figure 5.23 depicts a thematic scheme of communications and social media usage by citizens.

Chapter 5. Research Designed to Investigate Communication Practices and Social Media Usage by Authorities and Citizens in the PDR Phase of the Canterbury Earthquakes (September 2010 – February 2011)

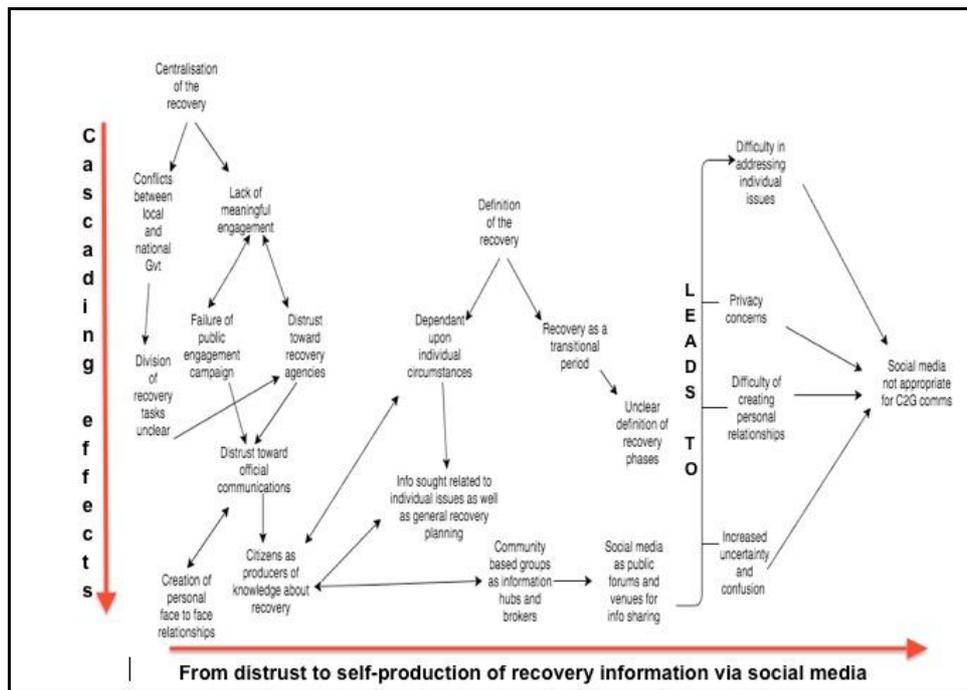


Figure 5.23. Thematic scheme of the communications and social media usage by citizens

5.6. Discussion

5.6.1. Communication practices and social media use by government agencies during the post-earthquake period in Canterbury region, New Zealand

Government agencies in Christchurch operated in an environment in which the uncertainty and complexity of governance activities were heightened by having to deal with unexpectedly large recovery efforts. In many cases, they learnt how to deal with such a process by doing it. Continual

aftershocks made it difficult to initiate essential recovery procedures, such as processing insurance claims. According to Paton and Johnston (2015), the “*aftershock sequence resulted in people, communities and response agencies having to cycle through response and recovery activities several times*”. This prolonged sequence of seismic events had significant implications on the recovery planning (Paton and Johnston 2015). Information about damages and new policies were often not immediately clear or available to government officials, who, however, had respond to the increased hunger for information of the public. Public pressures to speed up recovery and reconstruction clashed with the long periods needed to complete disaster damage assessments, establish new policies and agencies, and coordinate recovery efforts. The reconstruction process appeared as a transitional period marked by long recesses, rather than a neat and clear-cut process. Disaster reconstruction literature highlighted many of the problems that derive from the coordination of multiple stakeholders, conflict between short- and long-term goals, and between the compressed time of recovery and the extended timings of the recovery procedures (Ingram et al. 2006; Olshansky et al. 2006; Johnson 2014). What is missing in the literature is a discussion of how these issues influence the communication that occurs during disaster reconstruction.

In response to the situation of uncertainty, government agencies in the Canterbury region made use of a wide range of means to communicate complex messages to the population. Among these, face-to-face communication and printed material were preferred. The former offered more room for interactivity and fewer opportunities for misunderstanding. The latter was deemed to reduce the recovery information interpretation fatigue of the affected population. Survey responses and structured

observations revealed that the provision of recovery information occurred mainly through official websites but also via social media and telephone. The role of mass media such as television and radio in the recovery communication appeared to be less important, although some officials did use radio stations to provide information. Interviews shed further light on this finding. Communications during disaster reconstruction need to be well targeted and customized, as people increasingly tend to focus on individual issues (“my house, my insurance claims”) rather than on general ones. Thus, mass media were not suitable to give information that was relevant and utilizable to the people or social groups in the reconstruction phase. This finding conflicts with studies of communication during response, in which mass media were found to play a crucial role in disaster coverage (Scanlon et al. 1978; Scanlon 2007).

The variety of communication media used converged with the guidelines for post-disaster communication produced by international agencies (World Bank 2010). In the Canterbury post-earthquake context, communication media were used in a complementary manner and in a way that they could reach a broader audience, reduce information overload and minimize uncertainty. For instance, recovery agencies produced joint communications to ensure that the message got across consistently.

With regard to social media, government officials made considerable use of this technology to provide recovery information and respond to queries. Christchurch City Council and CERA were particularly active. Mature models of social media use for open participation were implemented (Lee and Kwak 2012). For example, during the consultation on the Transitional Recovery Plan, social media were seen as an additional way to

crowdsource community inputs. For this purpose, government agencies established hashtags on Twitter and invited the public to comment on Facebook posts. However, due to the legal requirement to document the identity of the submitters, these submissions could not be treated as a formal submission. Additionally, government agencies harnessed and collaborated with on-line groups for the dissemination of information. Community-based approaches in disaster recovery encourage collaboration with community groups as mediators and conduits of the communication (Bolin and Stanford 1998). Almost 70% of the survey respondents declared that they used social media for two-way communication.

Despite these positive aspects and the fact that recovery officers fully recognized the potential of social media for community engagement, social media-mediated communications often remained at the one-directional level or at a low level of interaction (i.e. merely responding to queries). Survey responses and interviews suggested that this was the case because government officers ultimately did not consider social media as the best means through which to communicate recovery information. Indeed, survey respondents clearly expressed the opinion that there were more appropriate tools for recovery communication.

Several considerations contributed to this opinion. To begin with, reduced interactivity on social media can increase the chance of misunderstandings and make more difficult convey complicated messages. In highly stressful and multifaceted environments such as post-disaster contexts, face-to-face communications help to clarify messages and reduce uncertainty. Secondly, to manage comments from distressed people on social media

was considered too demanding in terms both of time and the need to employ trained personnel. Structured observation of the recovery agencies' social media profiles highlighted the frustration of the people that face recovery problems. This frustration was expressed through harsh comments toward the agency's actions and priorities. Lack of personnel, time and specific policies to respond to and manage negative comments dissuaded recovery officers from adopting social media for community engagement. Thirdly, information on social media is often presented in an unstructured and asynchronous manner without the regulatory signals of face-to-face communication, and this can add confusion. This element was already identified in literature on computer-mediated communication (Riva 2002). Fourthly, social media may not be appropriate to reach all the social groups and to give information at the personal level, which is much needed in the reconstruction phase. Instead, government officials perceived social media as a public forum and a venue for information sharing among citizens. Fifthly, concerns over the spreading of misinformation discouraged officials from using social media. Monitoring and collaborating with social media groups was a partial solution to this problem.

The recovery agencies surveyed provided information mainly about traffic plans, infrastructure and housing reconstruction, psychosocial recovery and environmental risks. The prevalence of information about traffic plans and physical reconstruction might be explained by the amount of damage caused by the Canterbury earthquakes, especially to the infrastructure (Potter et al. 2015). Underground pipes were often damaged to the extent of requiring extensive repair works and the closure of roads and neighborhoods for months. Traffic plans and the public transportation system in the city were altered and residents and commuters experienced

major inconvenience. However, it should be noted that this finding might be biased by the fact that a good proportion of the respondents (9 out of 26) worked for SCIRT, the agency tasked with the oversight of the repair works of the infrastructure.

Providing information about housing reconstruction and environmental risks was considered crucial due to the environmental impacts of the earthquake (i.e. liquefaction) and the consequent implications for reconstruction works and land re-zoning. The attention paid to psychosocial recovery signaled an increase in awareness of the impact of the recovery on the mental well being of the population in Christchurch. Information about business recovery, and funds or refunds was among the least provided. Arguably, this result was partly a function of the dearth of respondents from private insurance companies and the Earthquake Commission (only one employee of this last agency responded to the questionnaire).

Information was addressed to all residents affected, with specific attention to homeowners, community groups and business owners. Once again, these social groups emerged as privileged interlocutors of the communications produced by recovery agencies. The least targeted included people with disabilities, adolescents and couples with children.

*5.6.2. Communication practices and social media use by citizens
during the post-earthquake period in Canterbury region,
New Zealand*

Interviews conducted with citizens affected by the Canterbury earthquakes confirmed that the reconstruction was perceived as a long, undefined

transitional phase with no clearly established turning points. Furthermore, the definition and timings of the reconstruction were massively dependent upon the individual circumstances experienced (i.e., level of property damage and capacity to settle insurance claims). For many of the respondents, the reconstruction period was characterized by long waits and by a sense that little was moving in terms of physical reconstruction of housing and the entire city. As a result, people primarily wanted to receive information about damage assessment, housing reconstruction, new traffic plans and routes and available funds or refunds. Information sought concerned both the individual and the community level. On the one hand, people articulated the need to receive information that helped them to resolve individual issues and claims. On the other, they wanted to know about the future of their city and why the Government prioritized certain recovery aspects over others. Besides this information, they expressed interest to know about psychosocial recovery and environmental risks resulting from the earthquakes. In the first case, evidence shows that support for psychosocial recovery emerged as a relevant concern for people surveyed, especially for female respondents. Indeed the literature on disasters has shown that female gender is a risk factor for the onset of post-traumatic stress symptoms after disasters (Galea et al. 2005). Thus women may look more often for information about psychosocial support to cope with the distress. Local authorities tried to address the increase of mental health issues across the Canterbury region by establishing mental health campaigns such as 'All Right?' Despite this, the Canterbury District Health Board faced financial and service cuts (McLennan 2016).

Environmental risks resulting from the earthquake were another major concern. The field notes collected during a community meeting confirmed

this observation. People were concerned about the effects of land damage and flood risk on the settlement of insurance claims and on the reduction in the value of residential property. Interestingly, people living in rural areas sought information about environmental risks and debris management more than those who resided in urban areas, which suggests that they had to deal in greater measure with the consequences of environmental impacts. Respondents to the questionnaire declared that they also looked for information about community based groups and associations. This aspect was further discussed in the interviews. The interviewees emphasized that community-based associations played a brokerage function in the communication between government agencies and residents. They exchanged information with the community. Social media represented information hubs and support forums for citizens to keep informed, share frustrations and hopes, and discuss matters. Interviewees showed a preference for receiving information on social media from other residents, especially because government agencies were regarded as more interested in producing PR communications than in engaging with residents. Thus information produced by recovery agencies was considered managed and distorted.

People turned to social media because getting information from recovery agencies was exhausting and unsatisfactory. The sense of disenfranchisement and disillusionment seemed to be directly linked to the perception that the recovery process was led by central government entities which were inattentive to the people's concerns and demands and often physically located outside the impacted zone. The top-down management of the reconstruction phase revealed conflicts between local and national authorities and the replacement of locally led plans with a

national agenda that favored private companies. I argued (Tagliacozzo and Arcidiacono 2016) that social media serve as alternative public space for people to achieve self-empowerment, especially in cases in which the recovery process is perceived as manipulated by government agencies, distorted by official media, or where there is a lack of clear recovery planning. Data gathered by interview seem to corroborate this argument. Interviewees presented themselves as knowledgeable individuals and as capable as recovery agencies of producing relevant knowledge about PDR. This is linked to the empowering effect of social media, which allows for collaborative problem solving and information dissemination and sharing. Additional research (Farinosi and Trerè 2016) proved that people adopted social media during PDR to document their daily lives and provide perspectives that were alternative to those of mainstream media.

It is not surprising that many of the respondents to the survey turned to social media and websites to seek information. As already mentioned, this finding can also be attributed to the typology of the sample surveyed, predominantly people with average to high income, a high level of education and living in the main urban agglomerations. These people were frequent social media users and were already accustomed to discuss social and political issues by this means. Printed material and telephone were quite well used in the PDR to obtain information, whereas television and radio remained among the least used channels. This last finding seems to confirm the observation that mass media lose much of their critical importance as an information source as people move from response to reconstruction. Conversely, even with the advent of social media, people continue to regard mass media as a primary information source during disaster response, along with friends, relatives and

neighbors (Burger et al. 2013).

The literature demonstrates that, when faced with a crisis, people use multiple information sources to obtain information (Anthony et al. 2013). This also seems to be the case in post-disaster reconstruction contexts. The complementary use of diverse information sources helps individuals to grasp the chaotic disaster reconstruction context and create a coherent and credible narrative.

Interestingly, on-line respondents seemed to receive information from a wider collection of sources than did off-line respondents. Sommerfeldt (2015) demonstrated that demographic variables are more capable of predicting media choice behaviors in post-disaster contexts than media access and level of damage experienced. Higher levels of education and income led to the use of a greater number of information sources. Arguably, in the case of this survey, the propensity to use social media for social and political discussions is also linked to an inclination to make use of a larger informational repertoire.

A noteworthy aspect is that the effects of the digital divide proved more evident in the on-line than in the off-line survey, as opposed to what was found in the Emilia-Romagna case study. Two factors may have contributed to this outcome: (a) respondents to the off-line survey were mainly community group representatives living in urban areas, whereas those that responded to the on-line survey were more spread out in terms of geographical area and demographic characteristics; and (b) the limited sample (N=29) of off-line respondents may have hindered the emergence of significant statistical correlations. People with a university degree proved to be more inclined to adopt the Internet to seek information about

reconstruction than those with less level of education (e.g. from a vocational or technical college) and those in the age range 46-55 were more inclined to use social media sites than were older respondents (+56 years). Conversely, older respondents showed a preference for printed material and television. Also, those respondents with low levels of income showed greater preference for printed material in comparison to those with higher incomes (over NZ\$140,000). Social and demographic characteristics significantly impact the preference given to traditional or innovative information repertoires in post-disaster contexts (Sommerfeldt 2015).

Face-to-face communications were by far the least selected means by both on-line and off-line respondents. However, interviews showed that people actually preferred face-to-face contacts with recovery officers and saw the development of personal relationships as a way to overcome the communication barriers. Thus, the lack of preference by people surveyed for face-to-face contact in favor of social media may be linked to the high level of distrust toward communications produced by the authorities. Credibility of source also comes out as an important factor when gauging the information received (Mileti and Sorensen 1990; Austin et al. 2012). A study conducted by Simons (2016) revealed that people in Christchurch had more trust in community-based and social media groups than government entities. People surveyed by Simons regarded information produced by government agencies as questionable and inaccurate. In particular they declared that central government entities (CERA, EQC and Parliament) were the least trusted among the recovery actors. It is therefore understandable that respondents to the present survey preferred to use social media platforms. Information offered by recovery entities was deemed to be not fully credible. Conversely, respondents gave preference

to gaining information through personal relationships created with trusted recovery officers.

A caveat is necessary here: social media were seen more as a place to share and receive information from other residents than a way to engage with recovery officers. In other words, the communications about disaster reconstruction on social media were more citizen-to-citizen (C2C) than citizen-to-government (C2G). This was especially evident for young respondents in comparison to respondents over 56 years old. Multiple reasons contributed to this. First, people were wary of the trustworthiness of the information given by recovery agencies and they did not think that the authorities were willing to have two-way conversations with residents by means of social media. Secondly, people were reluctant to present individual issues via social media for privacy reasons and because social media were perceived more as a public forum to share information. Interviews also indicated that people preferred one-to-one communications with recovery officers because such communication is timelier and less prone to misunderstandings. Lastly, respondents were aware of the recovery agencies' constraints in communicating via social media due to the lack of personnel, shortage of time and the difficulty of managing negative comments. From this, it appears that, despite being aware of the importance of social media as a tool of engagement with recovery agencies, the people surveyed did not consider this tool to be useful to them to hold discussions with the authorities about reconstruction. Additionally, respondents to the survey advocated that local agencies were more willing to discuss with residents via social media than were national ones. This finding is associated with the higher level of trust of people in Christchurch towards local entities than towards central government

(Simons 2016).

5.7. Conclusions

Findings from this study reveal that government agencies and citizens strove to deal with uncertainty and lack of information in Christchurch in the post-disaster context. The earthquakes generated a series of impacts at environmental, physical and human levels. The management of the reconstruction process, which was handled primarily by central government structures, added additional confusion. On the one hand, recovery agencies tried to provide information to the public while still gathering data on the damage experienced and still implementing new policies. By producing joint publications, they sought to guarantee consistency in the messages provided. They showed awareness of the need to offer information that was customized to individual issues and circumstances. Thus, they gave preference to face-to-face and printed communication while nevertheless using diverse means of communication. In addition, to disseminate information widely, some recovery officers actively sought the collaboration of community-based groups, some of which were based on-line. However, communicating under the uncertainty that characterized disaster reconstruction contexts was still a challenge. From their side, the citizens surveyed showed high levels of frustration and dissatisfaction toward the centralization of the recovery management and the lack of meaningful engagement of the population. They felt betrayed by recovery agencies that ultimately did not listen to their inputs and requests. As advocated by one of the interviewees, people in Christchurch became increasingly cynical about the consultation campaigns run by recovery agencies and many stopped participating. Thus, they became wary of the

information provided by recovery entities and gave preference to the information provided by other residents on social media platforms.

In this climate of uncertainty and lack of trust, the use of diversified communication channels and information sources helped both recovery officers and citizens to make sense of the whole situation. Looking at the type of information, housing and infrastructure reconstruction and traffic plans were needed by both recovery officials to provide and citizens to receive. This confirms the importance of re-establishing an appearance of normalcy in the physical environment and, in turn, it suggests the disturbing and alienating effect of living in a place where devastation prevails. Psychosocial recovery and environmental risks were shared concerns between recovery officers and citizens, highlighting the long-term incidence of mental health problems and environmental risks.

Data gathered from recovery officials and citizens revealed the centrality of community-based groups as mediators of the communication that occurs between recovery agencies and residents. Government officials addressed many of their communications to homeowners and community representatives and partially to business owners. It is noteworthy that disabled people were among the least targeted groups. This sheds light on the failure of recovery communications to reach underserved and vulnerable groups. The citizens surveyed gained information from a variety of sources. While local government, namely the City Council, still played a central role, it was not the only source of recovery information. Rather, information was also received from government agencies such as EQC and CERA and from private entities such as the repair companies selected to carry out the repair works.

Private insurance companies and Facebook groups emerged as additional actors in the recovery communication. The framework depicts a complex communication landscape in which several actors interact to construct new narratives of the reconstruction and make use of a wealth of means of communication for this purpose. Among these, for government officials social media represented an additional communication channel and for citizens an alternative information source.

Both government officers and citizens interviewed agreed that social media were public venues for information sharing and for residents to express frustration and find emotional support. Although many recovery agencies in Christchurch used social media platforms to convey information and to seek citizens' inputs during consultation campaigns, recovery officers expressed the opinion that there are other tools which are more appropriate for recovery communication. Interestingly, citizens and government officials shared the same doubts and concerns when articulating the potential use of social media for G2C and C2G communication during the reconstruction phase. Above all, social media communications were seen as costly in terms of time and people to employ and potentially an augments of confusion and misunderstandings in an already chaotic environment. In addition, the features of social media are not well suited to meet the communication needs during post-disaster context. Indeed communications during reconstruction needs to become increasingly targeted and customized around individual issues.

5.8. Limitations

Some limitations of this study should be noted. In the study with government agencies, respondents to the questionnaire worked mainly for

SCIRT and the nominated repair companies, which could have affected their responses, especially in respect of information provided. Furthermore, the observations of the official social media profiles occurred in a period of intense consultation campaigns to set out the transition from CERA to the new coordination agency, Regenerate Christchurch. However, not all the posts concerned the consultation campaign and respondents to the questionnaire avowed that they made extensive use of social media for recovery communications. This indicates that social media were an important means of communication for recovery agencies during the reconstruction phase of the Canterbury earthquakes. For the study of communication by citizens, the analysis of the demographic characteristics indicated that respondents to both on-line and off-line questionnaires belonged to privileged groups. This element could have affected the responses regarding the means of communication used to obtain information about recovery. It is my belief that the use of semi-structured interviews has partially balanced these biases, giving interviewees the opportunity to articulate more nuanced responses and to contextualize the phenomenon under study.

5.9. Toward a framework of communications and social media usage during post-disaster reconstruction

The next chapter will be devoted to the elaboration of a framework of communication and social media usage during post-disaster reconstruction. The framework will be derived from a comparison of the findings of the two case studies and from the identification of regularities that may suggest a trend in the communications that occur during disaster reconstruction. The emergent model will then be validated against general

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Usage by Authorities and Citizens in the PDR Phase of the Canterbury
Earthquakes (September 2010 – February 2011)

theories of communications and computer-mediated communications and
literature and models of government 2.0 and public participation.

Chapter 6

CROSS COMPARISON OF CASES AND CONSTRUCTION OF A THEORETICAL FRAMEWORK

This chapter will compare findings from the case studies described in Chapters 4 and 5. Before proceeding, I would like to add a methodological note. In order to produce valid results, comparisons have to be conducted in a focused and structured manner (George and Bennet 2005). They have to be structured, in that research questions are derived from, and directly reflect, research objectives and are applied to each case study under analysis. They have to be focused because they have to deal with only specific aspects and variables. The development of theories from case studies goes through several stages including: (a) formulation of research objectives, designs and questions; (b) carrying out each case study in accordance with the design; and (c) drawing on the findings and analysing them against the research questions (George and Bennet 2005).

The procedure outlined by Eisenhardt (1989) is analogous. After having conducted within-case analysis, the findings have to be sifted through for commonalities and the emergent frame compared must be against case data and existing literature. Kaarbo and Beasley (1999) suggest proceed looking for patterns within and across cases through a pattern matching approach. In pattern matching, *“a pattern predicted by the theory is matched against the pattern seen in the case”* (Kaarbo and Beasley 1999 p.387). This procedure is similar to the method of agreement introduced by Ragin (1987), in which “if two or more instances of a phenomenon under investigation have only one of several possible causal circumstances in common, the cause of the phenomenon is the one circumstance that is

present in all the analysed instances” (Ragin 1987 p. 36). Conversely, the method of differences suggested by Mill (1843) argues that *“If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance save one in common, that one occurring only in the former; the circumstance in which alone the two instances differ, is the effect, or cause, or a necessary part of the cause, of the phenomenon.”* (Mill, 1843, p 455). A mixture of the two methods will be used here to derive a framework, which will reflect a configuration of causes for the phenomenon under analysis, namely *“the effects of the contemporaneous presence/absence of a combination of factors, not of the presence or absence of each of them”* (Della Porta 2008 p.214). Given that this research uses a multiple case studies design (Yin 1984, 2014), data comparison follows the logic of replication and aims at analytical, and not statistical, generalisation (Yin 1984). A set of theoretical propositions will come out of this analysis, which will be compared with existing theoretical frameworks, thus increasing internal validity and generalizability (Amaratunga and Baldry 2001)

As a preliminary step, it is useful to recall the objective of this project, which lies in the investigation of communication practices and social media usage by government agencies and citizens during post-disaster reconstruction. Drawing upon this, the following research questions were formulated:

1. What communication practices (e.g. content of message, actors involved, channels of communication) can we observe by government agencies and citizens during a reconstruction process?
2. What is the role of social media in communication by government agencies and citizens that takes place during this period?
3. What are the attitudes, motivations and barriers to the use of social media in the long-term period after a disaster?

In what follows, each research question has been broken down into its components. Taken from there, a systematic comparison has been carried out of the variables that emerged from the case studies. Using a mixture of holistic and embedded design (Yin 1984), I drew conclusions about both the phenomenon as a whole and the sub-units that compose it. The results are discussed and successively integrated into a general framework.

6.1. Government to citizen (G2C) and citizen to government (C2G) communication practices

6.1.1. Government to citizen (G2C) and citizen to government (C2G) communication practices: content of the message

Data on the type of information provided by recovery agencies and sought by citizens during the PDR phase were derived from multiple-choice surveys. Due to the variety and number of methodologies to be handled, it was not possible to perform a full content analysis of the official websites and social media profiles. Rather, the analysis was confined to structured observations of the frequency and type (uni- or bi-directional) of web-based government communications related to recovery.

As for the content of the communication by government agencies, Table 6.1 shows that the Emilia-Romagna and Christchurch recoveries were quite different from one another. The reason for this is probably the difference in the type of government agencies surveyed. For the Emilia-Romagna case study, city council officers represented a large majority of the respondents. For the Christchurch case study, the range of respondents was more varied. It mirrored the assortment of government agencies involved in the reconstruction.

Table 6.1. Top four information provided by government agencies during PDR in Emilia-Romagna and Christchurch

Emilia-Romagna earthquakes recovery	Canterbury earthquakes recovery
Housing and infrastructure	Traffic plans and public transportation
Use of donations	Housing and infrastructure
Funds/refunds	Psychosocial recovery
Heritage preservation	Environmental risks

One recurrent element in both contexts is the importance given to the reconstruction of the physical environment (houses and infrastructure). In both Italy and New Zealand, providing information about physical reconstruction was considered critical for the recovery of the community. In the Christchurch context, government agencies were concerned about traffic plans, an element that also occurred in the responses given by citizens and thus signalled the importance of this aspect within the specific recovery process. Other variants seem to reflect directly the demands of the specific recovery process. For example, in Emilia-Romagna, the authorities strove to render the process as transparent as possible by the provision of data about the use of donations and public funds. Conversely, in the Christchurch context, the devastating environmental and psychological impact of the earthquakes translated into the centrality of these aspects in the G2C communication.

Proposition 1 (P1): *During the reconstruction phase, the type of message provided by government agencies depends on the type of agency and on the demands of the specific reconstruction process. However, messages*

about the reconstruction of the built environment are deemed critical to community recovery.

The type of information sought by the citizens in New Zealand and Italy (Table 6.2) appears to be more uniform: damage assessment and housing and infrastructure reconstruction, both referring to the reconstruction of the built environment emerge as the most sought after information, along with information about funds and reimbursement for rebuilding.

Proposition 2 (P2): *During the reconstruction phase, information sought by citizens primarily concerned the reconstruction of the built environment and the funds available to rebuild.*

Table 6.2. Four most sought information by citizens during the PDR in Emilia- Romagna and Christchurch

Emilia-Romagna earthquake recovery	Canterbury earthquakes recovery
Housing and infrastructure	Damage assessment
Business recovery	Housing and infrastructure
Funds/refunds	Traffic plans and public transportation
Damage assessment	Funds/refunds

6.1.2. Government to Citizens (G2C) and Citizen to Government (C2G) communication practices: targets

Information about the targets of communication during PDR was derived from surveys, interviews and contextual analysis and revealed that G2C communications during PDR are mostly addressed indistinctly to all the citizens.

Table 6.3 Targets of the G2C communications during the PDR in Emilia-Romagna and Christchurch

Emilia-Romagna earthquake recovery	Canterbury earthquakes recovery
All residents 94.1%	All residents 96.2%
Business people 32.4%	Homeowners 46.2%
Homeowners 26.5%	Community groups 46.2%
Community groups 20.6%	Business people 26.9%

Nonetheless, in both the case studies, business people, homeowners and members of community associations remained among the most targeted social groups (table 6.3). The interviews with government officers in Christchurch suggested that recovery communications focus on the individual rather than on the mass level. Thus, if, on the one hand, recovery officers made sure that the messages got across consistently across all the social groups, on the other they also tried to respond to the individual issues and demands.

Proposition 3 (P3): *G2C communication during PDR tends to be addressed to all the residents, although communication modes focus around individual issues. Homeowners, business people and members of the community groups remain preferred interlocutors.*

As far as the informational sources for citizens are concerned, results suggest that during PDR they may vary according to the level of centralization or decentralization of the recovery process and the number of recovery agencies involved.

Table 6.4. Information sources for citizens during the PDR in Emilia-Romagna and Christchurch

Emilia-Romagna earthquake recovery	Canterbury earthquakes recovery
City council (93%)	EQC (76.3%),
Regional council (26%)	City Council (73.9%),
Civil protection (21 %)	CERA (51.4%)
Fire department (20%)	Repair companies (31.6%)

In an extremely decentralized recovery process such as the Emilia-Romagna case study, the city council led the information provision function. Conversely, in the Christchurch earthquakes, several agencies contributed to the recovery efforts, including national government agencies (EQC and CERA) and private businesses (repair companies). Nonetheless, local governments (the city council) remained a central information source for citizens in both Emilia-Romagna and Canterbury region.

Proposition 4 (P4): *During the reconstruction phase, local governments (city and town councils) maintain a central role as information sources. However, the level to which other agencies act as information hubs depends on the centralization of the recovery management and the number of agencies involved.*

6.1.3. Government to Citizens (G2C) and Citizen to Government (C2G) communication practices: communication channels

Data on the channels used by government agencies and citizens to receive and provide information about reconstruction came from surveys,

structured observations of official websites and social media profiles, interviews, field notes, and contextual analysis.

With regard to the means of communication adopted by recovery agencies (see figure 6.1), the first evidence that comes to prominence in both the cases is the wide array of means used. In other words, government officers did not use a single communication channel to put recovery messages across. The Internet, including official websites and emails, was clearly much adopted. This finding was confirmed by survey responses as well as by structural observations of official websites of recovery agencies in Emilia-Romagna and Canterbury region. In Emilia, over half (58%) of the town councils affected had a dedicated section within their websites to provide information about recovery and so did two out of four provincial councils and the Regional Council. In New Zealand, 77.7% of the recovery agencies created a webpage designated for recovery information. One limitation of the comparison is that the percentage of “once a month” and “once a week” or “very often” and “fairly often” is presented in a combined manner for reasons of brevity and clarity. However, it should be noted that the channels selected with the highest frequency of usage was face-to-face interaction (68% in Emilia and 64% in Canterbury recovery). Interviews with recovery officers clarified that this was the case because the information given via face-to-face meetings was deemed to be less prone to misunderstandings and more suited to responses to the specific demands of the recovery process (i.e., give tailored and specific information). In a similar vein, communication via telephone leaves room for personal interaction and timely information exchange.

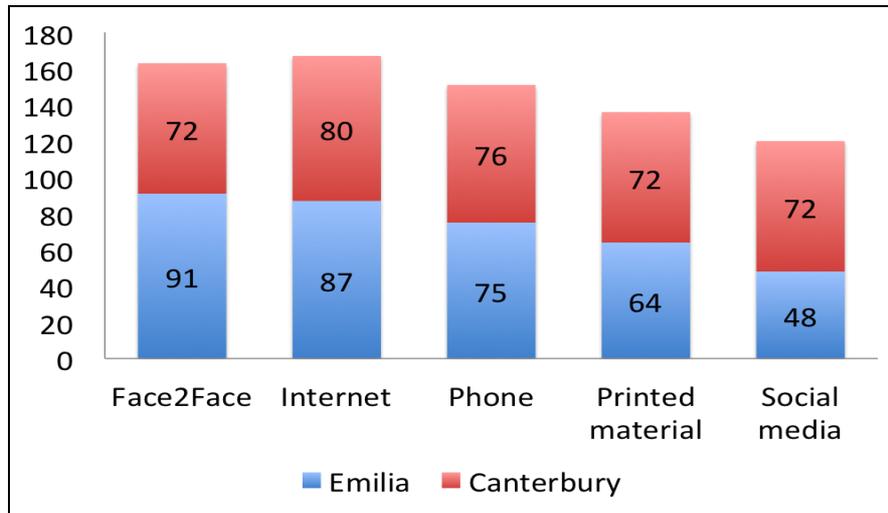


Figure 6.1. Communication channels used by government agencies to provide information during recovery in Emilia and Canterbury. The number in the bars indicates the combined percentage for the responses on usage frequency “once a month” and “once a week”.

Printed materials emerged as a critical means of communication during disaster recovery, in that they offer concrete information that people can take away and store. One can note the sharp difference in social media usage between the authorities in Emilia-Romagna and New Zealand. Further investigation, including structured observation of government agencies’ social media accounts over a six-month period, confirmed the higher frequency of usage by the authorities in New Zealand. Traditional mass media, such as television and radio, appear at the bottom of the ladder as a means adopted to provide recovery information.

Proposition 5 (P5): *Government agencies adopt a wide array of methods to communicate during the reconstruction period. In person communications and website communications are preferred, although telephone and printed material also play a relevant role. Social media are adopted by government agencies as a new means of communication on recovery, but frequency and modes of usage depend on the government agency and the specific reconstruction process.*

Proposition 6 (P6): *Traditional mass media channels (i.e. radio and television) are rarely used by government agencies to provide updates about reconstruction*

With regard to the communication channels used by citizens to receive recovery information, a separate analysis was performed on the surveys collected on-line and off-line. In each case, it is evident that in order to obtain recovery updates people adopted several communication channels at once.

Table 6.5. Communication channels used by citizens to receive information during the PDR in Emilia-Romagna and Christchurch

	On-line		Off-line	
	ChCh	Emilia	ChCh	Emilia
Internet	69%	81%	68%	57%
Social media	76%	66%	55%	40%
Face2 face	23%	59%	18%	85%
Printed	59%	50%	48%	70%
Phone	49%	35%	32%	29%
Television	44%	36%	26%	31%
Radio	42%	31%	30%	18%

On-line respondents in Emilia preferred official websites, social media and face-to-face interaction in order to obtain information, while on-line respondents in New Zealand had a greater preference for social media followed by the Internet and printed material and rarely made use of face-to-face interaction. A similar figure was found for the off-line respondents in New Zealand, probably because of the similar socio-demographic characteristics of the on-line and off-line respondents. Off-line respondents in New Zealand and Italy differed significantly with respect to age and social status, as Italian respondents were usually older, less educated and with lower social status. As a result, off-line respondents in Italy made massive use of personal interactions and printed material to obtain

updates, whereas off-line respondents in New Zealand rarely adopted in-person communication and preferred to use the Internet. Like the government agencies, citizens used mass media quite rarely to obtain information.

Proposition 7 (P7): *People adopt a wide array of methods to receive information during the reconstruction period. People already involved in web-based groups prefer to receive information from the Internet and social media. Channels used to receive information vary by age and socioeconomic status. Printed materials are used significantly.*

Proposition 8 (P8): *Traditional mass media channels (i.e. radio and television) are rarely used to receive updates about reconstruction.*

6.2. Social media usage by government agencies and citizens in the reconstruction period.

6.2.1. Role of social media and motivations for use in the G2C and C2G communications during the reconstruction period

Information about the use of the social media by government agencies and residents during the reconstruction process built upon survey responses, as well as structured observations of official social media profiles and interviews. The motivation for particular forms of use refers to how (i.e. for which tasks) the social media has been employed by the authorities and citizens. Conversely, exploring the role of social media means looking at how they fit into the general communication practices.

Table 6.6 shows that social media are primarily used by government agencies as an additional communication and outreach channel to provide updates about reconstruction and to respond to citizens' queries. In very few cases, these tools were used to ask the active collaboration and opinions of the citizens.

Table 6.6. Motivations for using social media by recovery agencies in the Canterbury and

Emilia-Romagna regions

Motivations for using social media during PDR:	Emilia earthquake recovery	Canterbury earthquakes recovery
Post information	80%	77%
Answer queries	54%	61%
Ask opinions	6%	11%
Ask collaborations	9%	0%
Ask create petitions	0%	4%

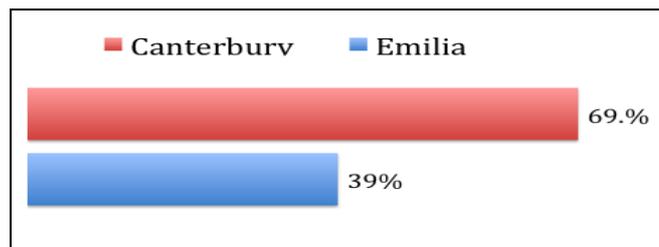


Figure 6.2: *Have you used social media for two-way dialogue with residents during PDR?*

However, observations of social media profiles and interviews with government officials in New Zealand revealed that in the Canterbury earthquake recovery, in some cases social media were harnessed for crowdsourcing for long-term recovery plans, ideas and dialogue. Survey responses highlighted the fact that authorities in New Zealand were inclined to use social media for two-way dialogue with residents during the reconstruction period (Figure 6.2). The emergent picture shows social media sitting beside and complementing other recovery communication channels rather than replacing them. One function of social media is to enable one to broaden the communication targets and support enduring engagement, especially with community groups.

Proposition 9 (P9): *During the reconstruction period, social media emerge as an additional communication and outreach channel for recovery*

agencies that complement other channels rather than replacing them.

From their side, citizens appeared to use social media to read and share information about the reconstruction and to organize themselves in company with other residents (Table 6.7). The term 'self-organisation' refers to the ability of a system to organise its components in a rational manner without the support of an external agent. In self-organising systems, the interaction and co-evolution of the components allow the emergence of a new order, which incorporate elements of the old one while creating new elements (Fuchs 2006). Social media enable citizens to coordinate efforts, work collaboratively and foster social connectivity during PDR in a way that allows new qualities and orders to emerge. Interactive communication technology has been shown to enhance the self-organising capacity of a community (Heylighen 2013).

Table 6.7. Motivations for using social media by citizens in the Canterbury and Emilia-Romagna regions

	On-line		Off-line	
	ChCh	Emilia	ChCh	Emilia
Read info	88%	74%	85%	85%
Post info	51%	32%	27%	44%
Self-organize with other residents	18%	18%	42%	11%
Contact an authority	5%	14%	15%	18%
Collaborate with authorities	3%	4%	0%	10%
Two-way dialogue	0%	9%	4%	3%
Not used	4%	3%	8%	0%

In the present study, citizens rarely used these platforms for engaging with authorities (Figure 6.3). Interestingly, people in Emilia-Romagna appeared

slightly more inclined than those in the Canterbury region to contact recovery agencies via social media, whereas off-line respondents in Canterbury region showed the highest percentage of citizen-to-citizen communication via social media.

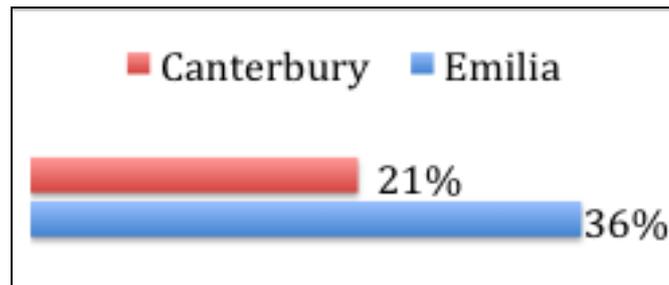


Figure 6.3: *Have you used social media to have a two-way conversation with recovery agencies?*

This finding is further confirmed by survey responses, which proved that respondents in New Zealand were reluctant to engage with the authorities via social media (Figure 6.3). This is true despite the fact that respondents in New Zealand are the more frequent users of social media, thus highlighting the fact that they prefer to use social media during the reconstruction process for other purposes than conversing with recovery agencies. Interviews conducted in New Zealand with government officers and community group representatives revealed that they both agreed on the definition of social media as a means for residents to share recovery information, discuss and organise their activities and support each other emotionally.

Proposition 10 (P10): *Citizens use social media during the reconstruction process to read and share information and to self-organise activities with other residents.*

Proposition 11 (P11): *In the reconstruction phase, social media are informational hubs and emotional support forums for residents.*

6.2.2. Barriers to the use of social media in G2C and C2G communications

during the reconstruction period

Data on the barriers to use of social media for recovery communications drew from survey responses, field notes and interviews. As far as the barriers for recovery agencies to communicate via social media are concerned, Figure 6.4 shows that lack of personnel and policies were among the most frequently mentioned challenges, followed by the fact that the agency had other priorities and concerns over security and privacy issues. Some 9.6% of the respondents in Emilia contended that agency’s policy forbade the use of social media at work, while some of the respondents thought that social media were not useful to communicate with citizens.

Field notes gathered in Italy and New Zealand and interviews conducted with recovery agencies in the Canterbury region revealed that social media were seen as public forums in which information was posted and shared freely. From this, it appears that communication via social media takes massive effort in terms of personnel employed and time.

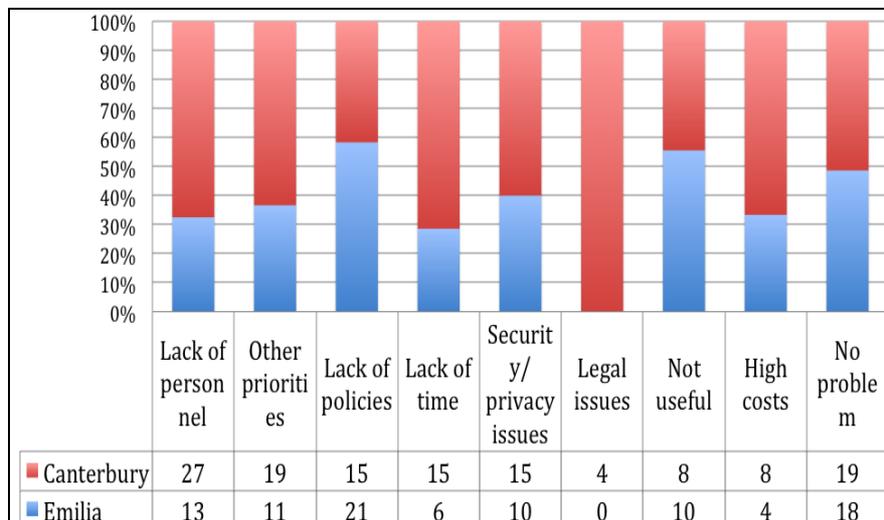


Figure 6.4 Barriers to social media usage by recovery agencies after the earthquakes in Emilia and Canterbury

Lack of clear social media policies results in recovery agencies investing more in other priorities and, arguably, in other communication methods.

Furthermore, privacy and security concerns harden the management of the information retrieved from social media. Field notes and interviews further highlighted the fact that communications mediated by social media were not regarded as capable of reaching out to all social groups. To this end, a variety of means of communication had to be adopted. Government officers in Italy and New Zealand found it difficult to handle complaints and negative comments from distressed people on social media, where conversations easily became acrimonious.

Proposition 12 (P12): *Barriers and challenges experienced by government officers in communicating via social media during the reconstruction period include difficulty in managing negative comments and distressed people, lack of guidelines, lack of personnel and time to monitor conversations on social media, privacy and security concerns over the management of the information, social media are not considered capable of reaching all targets and the adoption of other priorities by the agency.*

Table 6.8 sheds light on the challenges experienced by citizens when communicating via social media with the authorities during the reconstruction phase. Among the challenges most frequently mentioned there is lack of trust in the authorities and the belief that they do not use social media to discuss recovery-related matters with residents. Notably, on-line respondents in New Zealand showed a higher sense of distrust towards the authorities, which restrained them from using social media to have two-way conversations with recovery agencies. Respondents in the Canterbury region also showed more concerns about privacy than their counterparts in Emilia-Romagna. In some other cases, people expressed preference for using social media for purposes other than recovery communications. Interviews with community group members in New Zealand made it clear that people felt disempowered regarding their ability to change recovery agencies' decisions, which had a negative impact on any sense of the efficacy of the communications.

On the other hand, creating and nurturing personal relationships with

recovery officers seemed to increase the perception of being able to get accurate information.

Proposition 13 (P13): *Barriers and challenges experienced by citizens in communicating with the authorities via social media during the reconstruction period refer specifically to lack of trust and the belief that the authorities do not communicate via this tool. A sense of disempowerment regarding the ability to change recovery agencies' decisions may negatively affect people's willingness to engage in conversations via social media.*

Table 6.8. Barriers to use social media for communicating with recovery agencies

	On-line		Off-line	
	ChCh	Emilia	ChCh	Emilia
Privacy concerns	30.7%	1%	28%	9%
Use social media for other purposes	19%	18%	25%	9%
Don't trust authorities	43%	19%	14%	16%
Not used by authorities	31%	40%	21%	12%
No IT skills	1%	4%	7%	42%
No time	11%	13%	25%	25%
No problem	13%	11%	21%	7%

6.2.3. Attitudes towards the usage of social media in the G2C and C2G communications during the reconstruction period

Data about the attitudes toward the usage of social media built on survey responses

Figures 6.5 and 6.6 look at the attitudes toward the use of social media by the authorities and citizens to communicate with each other during the reconstruction phase. The comparison revealed that government agencies in New Zealand were far more inclined to use social media to discuss recovery-related matters with citizens than were their counterparts in Italy. They more frequently thought that citizens had sufficient skills and knowledge to discuss these matters. The result was confirmed by structured observations of social media profiles, which highlighted a more frequent and advanced use of social media by recovery agencies in New Zealand than in Italy. This finding might be also attributed to the type of respondents in New Zealand, mainly people employed in communication departments and therefore probably more familiar with the use of new communication technologies. The usage of social media for recovery communications seem to go hand in hand with the usage of social media for discussing general social and political issues.

However, in a further question, officers in New Zealand also expressed the opinion that there are tools that are more useful than social media to communicate recovery-related matters. This suggests that a positive attitude towards using social media does not necessarily translate into a more positive attitude toward this communication tool compared to others

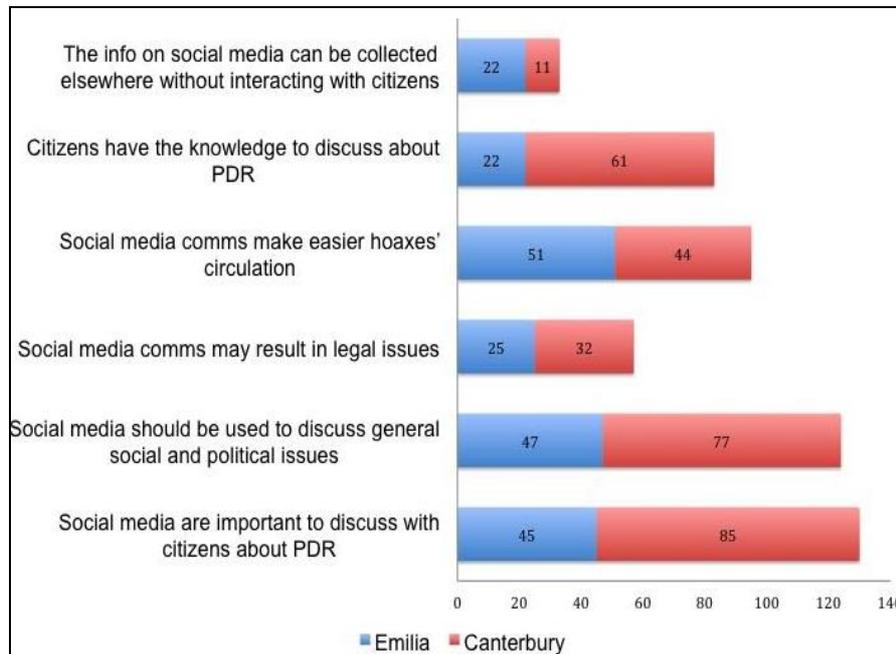


Figure 6.5: Attitudes towards social media use for recovery communications by government agencies. Agree and partially agree percentages were combined

Interestingly, potential legal problems deriving from social media communication were not considered to be a major concern for agencies in Emilia and Canterbury regions, while the spread of misinformation was a moderate concern. In both cases, officers acknowledged that information retrieved from citizens on social media could not be retrieved elsewhere without interaction.

Proposition 14 (P14): *Positive attitudes towards the use of social media for recovery communications go hand in hand with the use of social media to discuss general social and political issues and the belief that citizens have the skills and knowledge to converse on recovery-related matters via social media. Concerns over potential legal issues have only a minor effect on this attitude, but fears about the spread of misinformation have a moderate effect. Positive attitudes toward using social media do not necessarily translate into a more positive attitude towards this communication tool compared to others.*

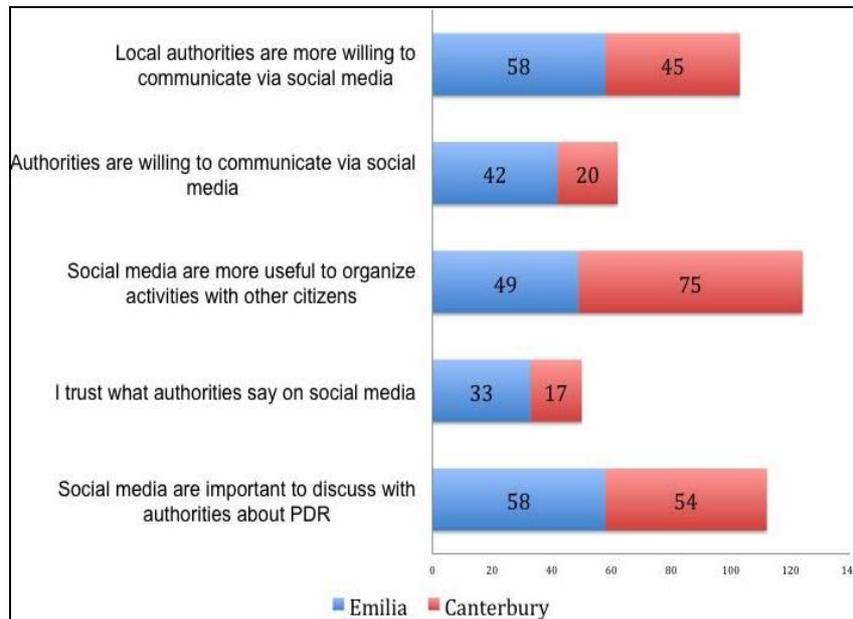


Figure 6.6: Attitudes towards social media use for recovery communications by citizens. Agree and partially agree percentages were combined

From their point of view, citizens in Emilia-Romagna and Christchurch moderately agreed on the statement that social media are important for communicating with recovery agencies and that local authorities were more willing to communicate via this method. More interestingly, citizens in New Zealand appeared far less trusting in the communications by authorities and in their willingness to engage in two-way conversation. Conversely, they were more inclined to adopt social media for organizing activities with other residents. Further questions to respondents in New Zealand revealed that they were quite accustomed to the use of social media for social and political discussions (58% of the respondents) but they did not think that social media were useful to communicate with recovery agencies (60%). This suggests that a general positive attitude toward social media as a communication tool, and familiarity with this tool, do not necessarily translate into the perception of the usefulness of this instrument for recovery communications with official agencies. Trust in government agencies seems to be a mediating factor.

Proposition 15 (P15): *A general positive attitude toward social media as a communication tool for recovery communications and the familiarity with*

this tool for political discussions do not necessarily translate into the perception of the usefulness of this instrument for communicating with the authorities. Trust in government agencies and in their communications seem to be a mediating factor. Conversely, a high sense of distrust leads to the use of social media for self-organizing with other residents.

6.2.4. Two-way communication: social media of reference

Data on the social media used by recovery agencies and citizens to communicate with each other were derived from survey responses, as well as from structured observations of social media profiles.

While Facebook appeared to be the most widely used platform for recovery communications for officers in New Zealand and Italy, a sharp difference can be observed in the use of other social media, especially Twitter (Figure 6.3). Recovery agencies in New Zealand used Twitter far more frequently; a finding confirmed by structured observations, which revealed that 100% of the recovery agencies had a Twitter account compared to only 40% in Italy. Similarly, YouTube was adopted by 15% of the Italian agencies and 45% of the agencies in New Zealand. This suggests that recovery communications occurs through social media already in use by government agencies rather than through specific channels.

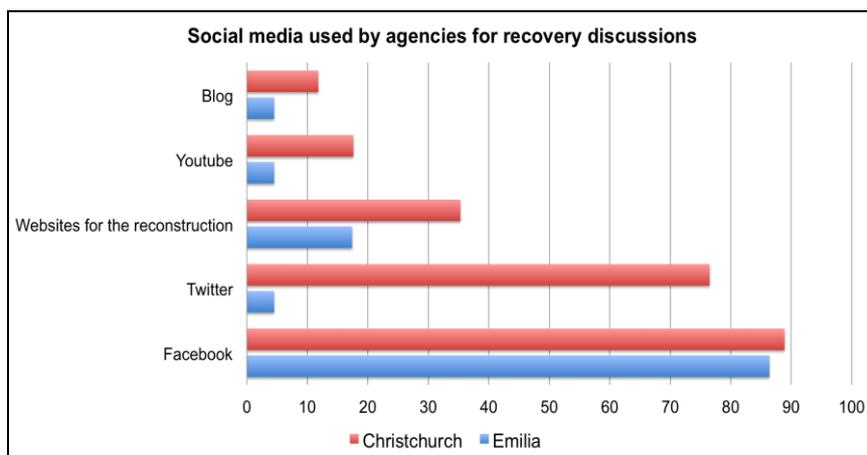


Figure 6.7. Social media platforms used by agencies for recovery discussions

Overall, agencies in New Zealand appeared to adopt a wider range of

social media for communicating with citizens than did those in Italy. The overreliance of government agencies in New Zealand on Twitter is counterintuitive, given that in 2011 the social media site did not emerge among those most used by New Zealanders (Alexa 2011) or in 2016 (Alexa 2016). Arguably, this is the case because Twitter is (a) easier to manage under time and resource constraints, given that tweets resemble short public releases (maximum 144 characters); and (b) it leaves less space than Facebook for open discussion.

Proposition 16 (P16): *Social media-mediated recovery communication occurs through platforms already used by government agencies rather than through other specific channels.*

Regarding the social media used by citizens to communicate with recovery agencies, Figure 6.8 shows little difference between Italy and New Zealand. In both cases, Facebook was by far the most widely used platform, followed by websites created for the reconstruction. One possible explanation of this is that Facebook features support social information (Quan-Haase and Young 2010) and two-way dialogue (Auger 2013)

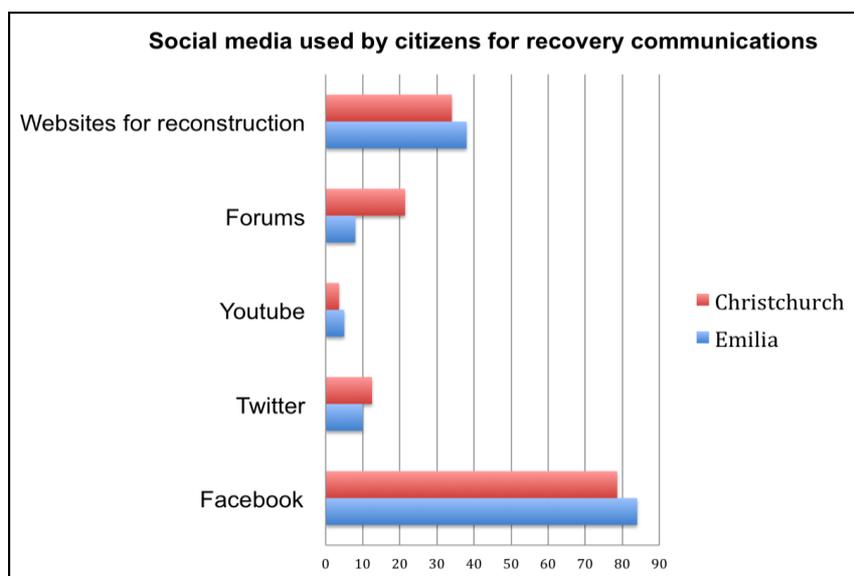


Figure 6.8 Social media platforms used by citizens for recovery discussions

For example a recent survey conducted by IPSOS (2015) on digital politics

in the UK outlined that 83% of the respondents received some political contents on Facebook and only 25% via Twitter and 9% via YouTube. Alternatively, this could be the case because Facebook was already the most widely adopted social media technology in these countries (see the section below on the relationship between recovery communications and pre-existing communication dynamics and trends).

6.3. Other emerging communication dynamics

6.3.1. Other emerging communication dynamics: role of community-based groups within recovery communications

Although not explicitly probed in the surveys, or in the general research questions, the role of community-based groups appeared to be critical in the communications by government officers and citizens that occur in the reconstruction period. This aspect was clearly stated in the interviews with community group representatives in New Zealand and informally discussed in Emilia-Romagna. Community groups, some of them existing merely in the cyberspace, serve as brokers and amplifiers of the information provided by recovery agencies. They aggregate information into a single hub, often in the form of Facebook pages or other webpages (e.g. blogs), and then they re-distribute recovery information through various outlets. In some cases, they clarify the information and make it more comprehensible for other citizens. Having professionals and experts among their members, they can elucidate difficult procedures and regulations. In other cases, they have direct relationships with recovery officers and can point a person in need to the right official to resolve a specific issue. In so doing, they mediate the relationship between the community and the recovery agency by conveying recovery information to and from the community. Community groups also serve as hubs for citizens to express their feelings and thoughts in regard to the reconstruction process and to receive and seek practical, emotional and informational support.

Proposition 17 (P17): *Community-based groups, including those supported by the social media, serve as hubs for information and*

emotional support during the reconstruction period. They also work as brokers and amplifier in the communications that occur between the authorities and citizens.

6.3.2. Other emerging communication dynamics: general communication issues for citizens and agencies during the reconstruction process

Information about general communication issues experienced by recovery officers and citizens during the reconstruction phase was gathered through formal and informal interviews in New Zealand and Italy. For the recovery officers, it appeared that the uncertainty surrounding recovery procedures and timings had a relevant impact on the dimensions of communication. After an emergency, recovery procedures and responsibilities are to be set, new agencies are to be established and laws are to be enforced to make sure that the reconstruction occurs in a manner that is designed to reduce future risks. Although many of these activities should be organized before the emergency, this is often not the case. As a result, the organization of the new institutional and policy framework and the activities related to damage assessment and refund claims takes time to be initiated. Government officials find themselves in a position of 'learning by doing' while facing increasing pressure by the public to give out accurate and timely information. Government officials in New Zealand also mentioned the difficulty of explaining complex and technical information, reducing information overload and facilitating the formulation of recovery messages. To this end, they gave preference to printed material and in person communications.

Proposition 18 (P18): *Communication issues experienced by recovery agencies relate to the uncertainty of recovery procedures and timing, as well as to the management of complex messages and people's dissatisfaction and information overload.*

As for the citizens, people in Emilia and Canterbury expressed a sense of

dissatisfaction and distrust toward the information provided by recovery agencies. Lack of trust can therefore be considered one of the main barriers to C2G communication. In relation to this, some interviewees in New Zealand and Emilia expressed the opinion that community group members were as capable as government agencies of producing and sharing information about recovery and reconstruction. Interviewees in New Zealand also related how tiring it was to reach out to government officers, who often responded via fixed templates or were perceived to be unwilling to provide updates.

Proposition 19 (P19): *Communication issues experienced by citizens relate to lack of trust, dissatisfaction toward communications produced by recovery agencies and fatigue in reaching out to recovery officers.*

6.3.3. Other emerging communication dynamics: definition and timings of the recovery depend on individual circumstances

One aspect that emerged during the case study in Emilia-Romagna was that communication needs might change according to the recovery phase. Building on this, the case study in New Zealand used in-depth interviews to investigate the recovery phases and the consequent communication dynamics. Both government officers and citizens interviewed agreed that the recovery could not be defined as a linear or clear-cut process. Rather, its definition depends on the individual circumstances experienced (e.g. level of damage of the house and of the neighbourhood). Also, for the Canterbury earthquakes, people and officials went through a sequence of aftershocks, which resulted in a cycle of emergency - response - recovery - new emergency. It can cogently be argued that these elements shaped the timings of the reconstruction process and, in turn, of the communication practices by government agencies and residents. Similarly, Hogg (1980) noted that the reconstruction in Venzone after the earthquake that struck Friuli (Northern Italy) in 1976 was delayed by several factors, including historical trends as well as by the occurrence of a second major shock four months after the first event.

Proposition 20 (P20): *The characteristics and timings of the recovery process depend on the individual circumstances experienced and the occurrence of new emergencies after the first event. Different circumstances imply different communication practices and needs.*

6.3.4. Other emerging communication dynamics: from mass to individual modes of communication

Interviews with government agencies in New Zealand shed light on a new aspect of recovery communications. Indeed they showed that the communications in the response phase and early emergency phases favoured mass forms of communication and focussed on what people should do, what will happen and which new agencies and regulations will be set up. As the recovery process proceeded, citizens' queries became increasingly related to individual issues, implying that recovery updates needed to go from mass to interpersonal modes of communication. During disaster reconstruction there is a critical need to ensure full outreach and coverage of recovery messages, hence to reach out all the social groups and especially the most vulnerable ones. For their part, citizens in New Zealand equally expressed the need to receive information at the individual level (i.e. what will happen to their neighbourhood) although they showed interest also in more general information, such as that on urban planning and the rationale used to prioritize some areas over others in the recovery. It was not possible to confirm these insights in the Emilia-Romagna case study because this dimension was not explicitly probed and because it did not emerge naturally during informal conversations with recovery officers and representatives of community groups. However, the fact that government officers and citizens in both Emilia-Romagna and Canterbury made infrequent use of traditional mass media (which are instead largely used during disaster response) seems to support the argument that recovery communications need channels that support interpersonal and targeted modes rather than mass communication ones.

Proposition 21 (P21): *As the recovery proceeds, G2C and C2G communication modes need to go from the mass to the interpersonal*

levels. As a result, traditional mass media become less relevant for providing and receiving information.

6.3.5. Other emerging communication dynamics: comparison between pre-existing and general communication trends in the two countries and patterns of recovery communication after disasters

A short analysis was carried out to verify the effects of pre-existing and general communication trends on communication patterns during recovery. In other words, the intent was to understand whether recovery communications presented any peculiar aspects or simply followed from pre-existing and general trends in the field in question. Data on existing communication trends were derived from national surveys and statistics. In Italy, Facebook turned out to be the most widely used platform for interaction during the reconstruction phase, but it was already the preferred channel at the national level before the earthquake (OPERA 2011). Elected officials (i.e. mayors and councillors) were the most active users of social media, both before (OPERA 2011) and after the disaster. In 2011, officials in Italian municipalities adopted social media mainly for the provision of information, a finding mirrored for recovery communications. Before the earthquake, Italian municipalities encountered issues in the uptake of social media due to high costs, perceived lack of utility, lack of personnel, lack of competencies and professional figures, and perceived lack of utility. During the reconstruction period in Emilia-Romagna, lack of personnel was also a major concern about adopting social media, but lack of guidelines and the difficulty in managing negative comments outweighed other challenges. This is probably the case because clear guidelines are needed more during reconstruction processes, when both levels of uncertainty and expectations from the public are high. As for the Canterbury earthquake case study, it was not possible to retrieve statistics that specifically tackle social media usage before the earthquake. However, the Government Social Media Guidance launched in 2011 was defined as “the best so far produced” (di Maio 2011), given that it provided

clear and concretely applicable advice to officers on how to engage with the public. In the same year, the New Zealand Police Department won an award for the best use of social media (Socialmedianz 2011). It is reasonable to conclude that when the second earthquake occurred New Zealand Government bodies were already on the way to embracing social media and creating policies to support dialogue. However, the earthquakes certainly gave a spur to innovation in on-line communication. For example, before the disaster, there were only three earthquake-related government websites. Another eight websites added to these after the September event (Bourk et al. 2015). After the February event, Christchurch City Council initiated for the first time an integrated social media strategy that included Facebook, Twitter and a WordPress site (Sutton 2012).

Proposition 22 (P22): *Patterns in government communication during the reconstruction period follow from pre-disaster and general communications trends in the country. However disasters push agencies to innovate and find new ways to interact with the public. In such contexts, where uncertainty and expectancies are high, clear communication guidelines are essential.*

Statistics in New Zealand and Italy regarding use of the Internet and social media revealed differences by age, education and income level. Younger, well-educated and wealthier individuals are more active users (Demos & Pi 2013; Gibson et al. 2012; Crothers et al. 2014). The same trend was highlighted by statistical analysis of the responses in Emilia-Romagna, as old and less educated people remained less likely to be social media users or to engage in recovery conversations via this method. In both contexts, Facebook was the most widely adopted social networking site (GWI 2012; Gibson et al. 2013) and it continued to be so regarding interaction with recovery agencies. In Italy, because of their lack of IT skills elderly people did not benefit from the Internet (ISTAT 2012) and for the same reason they did not look for recovery information on social media. A study conducted in 2011 in New Zealand revealed that half of the respondents looked up on the Internet to get information about public services but only 30% looked for active communications with government agencies (Gibson

et al. 2012). After the Christchurch earthquakes, the use of social media to obtain recovery information was high, but relatively few people (21.4%) valued social media for interacting with recovery agencies. Between 2012 and 2014 in Emilia Romagna, 29% of people exploited the Internet to search for information from government agencies (Regione Emilia-Romagna website, 2014), which was thus much less than in New Zealand. This may suggest that prior usage of social media by citizens to obtain political information may predict higher usage during the recovery process, but not necessarily the level of interaction with the authorities.

Proposition 23 (P23): *Patterns in citizens' communications during the reconstruction period follow from pre-existing and general communications trends in the country, especially with respect to the digital divide. However, when it comes to engaging in a conversation with the authorities on social media, trust is a critical fact.*

Tables 6.9 and 6.10 compare and summarise communication practices and social media usage by citizens in Emilia and Canterbury regions

Table 6.9. *Summary of the trends of communication and social media usage by citizens*

Citizens to Governments	Emilia	Canterbury
Information	<i>Built environment/ Funds</i>	<i>Built environment/ Funds</i>
Channels	<i>Multichannel</i>	<i>Multichannel</i>
Target	<i>Localised</i>	<i>Distributed</i>
Social media usage	<i>Read and share information with residents</i>	<i>Read and share information with residents</i>
Barriers to social media usage	<i>Trust/social disparities</i>	<i>Trust/social disparities</i>
Actor	<i>Multiple</i>	<i>Multiple</i>

Table 6.10. *Summary of the trends of communication and social media usage by governments*

Government to Citizens	Emilia	Canterbury
Information	<i>Built environment/ economic revitalisation</i>	<i>Built environment/ psychosocial and environmental recovery</i>
Channels	<i>Multichannel</i>	<i>Multichannel</i>
Target	<i>Indiscriminate/ Powerful social groups</i>	<i>Indiscriminate/ Powerful social groups</i>
Social media usage	<i>Dissemination of information</i>	<i>Dissemination of information/ Collection of Citizens' inputs</i>
Barriers to social media usage	<i>Organisational and related to the characteristics of the recovery process</i>	<i>Organisational and related to the characteristics of the recovery process</i>
Actors	<i>Multiple/ Localised</i>	<i>Multiple/Distributed</i>

6.4. Integration of regularities into existing literature and models

In the following section, I will interpret the propositions stated in the above sections in the light of the literature on disasters, communication and e-government. The rationale for is two-fold. First, patterns highlighted in the propositions can be corroborated or rejected by existing literature and models. In the first case, the internal validity and generalizability of the finding is strengthened (Amaratunga and Baldry 2001). In the second case, more research is required in order to verify whether the pattern reflects a generalizable characteristic of the recovery communication or is biased by the context and size of the sample analysed. Secondly, a comparison with the existing literature and models reveals new dimensions of the pattern, thus expanding its meaning and applicability.

6.4.1. Integration of regularities into disaster literature and models

The first two propositions (P1 and P2) assert that information about the reconstruction of the built environment is central to both citizens and authorities. Literature on recovery and reconstruction has also put emphasis on sheltering and housing after disasters (e.g. Quarantelli 1982, 1995; Oliver-Smith 1990; Bolin and Stanford 1991; Johnson 2007). Although this seems to be justified by people's need to live in an environment perceived as safe and functional, other dimensions should not be neglected. For example, when rebuilding it is important to take into consideration cultural traditions and indigenous knowledge (Twigg 2006), the sense of place (Alexander 2004; Zetter and Boano, 2008), the need for more equal and sustainable long-term development (Berke and Campanella 2006) and the preservation of social capital (Nakagawa and Shaw 2004). Economic and financial dimensions of recovery have proved critical in the two case studies and are widely tackled in disaster studies (e.g. Dahlhamer and Tierney 1996; Chang 2000; Webb et al. 2002; Rose 2004).

Proposition 4 posits that local government agencies are central actors in

recovery communications. Disaster literature emphasizes the importance of a locally driven recovery and of increasing the capacity of local government officials to respond to post-disaster needs (e.g. Berke et al. 1993; Stehr 2001; Smith and Wenger 2007). However, in centralized and top-down recovery, central government agencies tend to overshadow and supplant local actors in recovery functions and responsibilities. Decentralization is about devolving power to local government levels (Lyons 2009). This research seems to suggest that recovery communication networks mirror the model of recovery management. In decentralized approaches (e.g. Emilia-Romagna), the information provision function is devolved to local government actors, whereas in a centrally managed recovery processes (e.g. Canterbury earthquake) it is distributed among central and local actors. In turn, recovery models adopted after disaster may be derived from pre-disaster historical and cultural patterns that are manifest at various societal levels (i.e. governance, economy, community social capital etc.).

Proposition 24 (P24): *In decentralized models of recovery, the information provision function is devolved to local levels of government. In centralized models of recovery management, the network for the provision of information is more widely distributed.*

Decentralization is about encouraging the engagement of communities in the recovery process through public information and awareness campaigns (Bouraoui and Lizarralde 2013; Garnett and Moore 2010). The New Zealand Government tried to run multiple consultation campaigns but this did not give the expected results because the agencies were not perceived as trustworthy nor was their engagement perceived as meaningful. Centralized approaches to reconstruction, coupled with lack of information, proved to be associated with the dissatisfaction of end users (Bouraoui and Lizarralde 2013). Especially for the Canterbury case study, the results of this research suggest that high levels of centralization and lack of meaningful engagement led to high levels of dissatisfaction about the recovery management and distrust of official recovery communications. Propositions 13, 15 and 16 also shed light on the mediating function of

trust in recovery communication. Numerous studies have highlighted the role of trust in the determination of recovery outcomes. For example, Yandong and Changhui (2015) demonstrated that trust in government and in social institutions dropped dramatically after the Sichuan earthquake compared to the pre-disaster level. Among the antecedents of political distrust after disasters, studies have identified negative policy appraisal, lack of informational and emotional support from the local government (Zhang and Wang 2010), pre-disaster distrust, gap between public expectations and local government capacity (Han et al. 2011), and negative evaluation of the government performance (Nicholls and Picou 2013). Chatfield and Barrett (2011) maintained that disaster communication deficits result in the erosion of public trust.

On the other hand, a low level of political trust has several negative consequences for disaster recovery including people's unwillingness to allocate resources to communal facilities (Zhang and Wang 2010), perception that the quality of life is poor (Liang 2016), pessimistic predictions about the timing of recovery (Nicholls and Picou 2013), and decisions to migrate away permanently (Reinhardt 2015). This research suggests that there is a relationship between lack of confidence in governmental work after disaster and unwillingness to put effort into a conversation with recovery agencies. Poor perception of informational support is hypothesized here to work as both antecedent and consequence of distrust in government. In other words, the perception that a recovery agency is either unwilling or incapable of providing appropriate information leads to general distrust in government, which translates into reluctance to commit oneself to interact with recovery agencies.

Proposition 25 (P25): *A high level of centralization and lack of meaningful engagement lead to high levels of dissatisfaction toward the management of recovery, which translates into distrust of official recovery communications and unwillingness to engage in conversations with officials.*

It has been argued (Nigg and Tierney 1993) that, through blaming and

accountability mechanisms, disasters themselves can produce a loss of confidence in government. Government bodies can be deemed accountable for the failure to prevent and manage disaster events. The re-establishment of trust in the ability of government to enforce policies that protect citizens is critical to community recovery. When confidence lapses in the government's ability to provide services, information and emotional support after a disaster, community-based groups may step in to fill the vacuum (Rivera and Nickels 2014). Lanzara (1983) and Stallings and Quarantelli (1985) maintained that community-based organizations emerge in the wake of a disaster to respond to community needs that are perceived as being ignored or neglected by government agencies. As a result, the relationship between these organisations and the government is often hostile (Stallings and Quarantelli 1985). In the wake of both the Canterbury and Emilia-Romagna earthquakes, many of these organizations sprang up to fill the informational gaps left by authorities as well as to amplify, clarify and mediate official recovery communications (see Proposition 17). While some of these organizations acted as a counterpart of government agencies, in other cases they worked alongside recovery officers (see, for example, CANcern in New Zealand). The emergence of these groups facilitated a decentralized approach to recovery management (Storr and Haeffele-Balch 2010), taking power away from central government entities.

These findings can easily be linked to literature about social movements in the digital era (e.g. Juris 2005; Bennett and Segerberg 2011; Lim 2012), where social media are pictured as catalyst, facilitator and amplifier of social mobilization and a mouthpiece to express discontent. Elsewhere, I hypothesized that social media serve as a way to stand up to the authorities during post-disaster reconstruction, especially when the recovery process is perceived as manipulated, when centralized approaches are implemented with the exclusions of citizens and local actors and when official media are regarded as untrustworthy and biased by political interests (Tagliacozzo and Arcidiacono 2016). The two case studies offered here provide empirical evidence in support of this

argument, but future research should test the statistical correlation between these dimensions.

Along with homeowners and business people, community groups are the preferred targets of the G2C communications during the recovery period. Power structures and relationships are reflected in networks that exist to provide recovery information. The interests and informational needs of powerful people are more highly accounted for and better fulfilled. Indeed marginalized groups are rarely represented in emergent organizations (Quarantelli 1985).

Proposition 26 (P26): *Power structures and relationships are reflected in networks that provide recovery information. The interests and informational needs of powerful people are more accounted for and better fulfilled than are those of the less powerful.*

Propositions 5 to 8 deal with channels for recovery communication by government agencies and citizens. They note that both parties used a wide range of methods to communicate during the recovery period. With respect to the literature on disaster communication, this finding is not new. It argues that information-seeking behaviour is heightened during disasters or crises because of the high level of uncertainty (Tierney 2009). As a consequence, people rely on multiple information sources in order to reduce the uncertainty (Spence et al. 2007a). Government agencies are therefore advised to embrace a multi-channel approach to respond to the needs and preferences of societal groups and actors (Liu et al. 2014). One can conclude that uncertainty lingers on into the reconstruction phase (Olshansky 2005), thus making more salient the need for information and expectations of responsiveness towards recovery agencies. More interesting is the finding concerning the role of traditional mass media (e.g. television and radio), whose importance seems to be diminished in the disaster recovery (Propositions 6 and 8). Disaster communication literature showed the importance of these media during the response phase in terms of disaster reporting (Scanlon et al. 1978) and as primary information sources for people involved in the disaster (Wray et al. 2004; Spence et al.

2007a; Burger et al. 2013). The decreasing importance during the recovery period can be linked to the fact that the news coverage from mass media declines a few weeks after a disaster (Lobb et al. 2012), thus diminishing the potential role of these media in community recovery (Greenberg and Scanlon 2016).

Proposition 27 (P27): *Mass media (television and radio) have restricted usefulness for both the receipt of recovery information by citizens and the provision of recovery information by the authorities. The reason for this is that disaster coverage in traditional mass media diminishes during the reconstruction phase.*

It is important to note here that the term 'mass media' refers more to a communication mode than a communication channel. Television and radio are traditionally regarded as mass media because they provide information in a one-directional and indiscriminate fashion and at a large scale. Newspapers fall under the umbrella of the mass media as well. In contrast to this, local newspapers, newsletters and booklets can play the role of providing information to a specific population and in a specific area, thus limiting their scale of outreach. Empirical data from the Canterbury recovery suggest that recovery communications require going from a mass to an interpersonal communication level. This is to say, as demands become increasingly more specific with the progress of the recovery, communication modes must adapt accordingly (see Proposition 20). Thus channels that do not support targeted communications modes are progressively abandoned.

Another finding concerns the impact of the digital divide on the choice of communication channels. Elderly people with low levels of education and employment status are less likely to take advantages from the potential of new communication technology. Rather, they give preference to traditional information sources, such as printed material and television. The finding was particularly evident among the respondents to the printed survey in the Emilia-Romagna case study, though it was partially highlighted in the on-line survey undertaken in the Canterbury region as well. The finding

mirrors other research on communication habits after disasters (e.g. Madianou 2015; Sommerfeldt 2015), which have highlighted how access to and usage of new technologies during recovery reflects and perpetuates social inequalities.

Proposition 28 (P28): *Access to and use of new technologies during disaster reconstruction reflect and perpetuate social inequalities.*

Propositions 12 and 18 articulate the barriers and challenges that recovery officers face when communicating with the wider public during disaster reconstruction. With specific reference to social media, the barriers to use during disaster reconstruction reflects some elements already identified in the literature on governmental use of social media (Mergel 2013a) in disaster response (Hiltz and Gonzalez 2012; Beneito-Montagut et al. 2013). Among them, emerging central issues were lack of personnel and time to monitor and respond to social media conversations, fear of the spread of misinformation, lack of policies, and privacy concerns. Uncertain decision-making, time and resource constraints, and high public expectations are also issues that are shared between disaster response and disaster reconstruction, although the dimensions and weight of these issues can change between the two periods.

Uncertainty about tasks during disaster response is composed of several dimensions including task novelty, difficulty of analysing tasks, amount of task information, task urgency and task impact (Rocha et al. 2009). Although a discussion about the role and dimensions of uncertainty during disaster reconstruction is beyond the scope of this research, empirical data collected, and the existing literature, suggests that task uncertainty and complexity are important elements in post-disaster settings (Olshansky 2005; Hayles 2010) and that they may have an effect on communications during this phase. For example, the Rubin and Barbee model (1985) suggested that local recovery could be expedited if local officials have the ability and reason to act, knowledge of what to do and sufficient political awareness and astuteness. Effective planning can compensate for lack of experience and knowledge (Kartez and Lindell 1987) and make dealing

with and communicating recovery decisions and uncertainties easier. Empirical data also suggest that during PDR recovery officials struggle with the management of frustration and anger. The increase in these negative emotional reactions can be explained by the fact that initial solidarity and euphoria (the 'heroic' and 'honeymoon' stages) are replaced by anger and frustration and more realistic evaluations of the long term ('disillusionment' and 'reconstruction' stages) (Farberow and Gordon 1981).

Proposition 29 (P29): *The emotional reactions of the disillusionment and reconstruction phases make it more difficult to communicate during the recovery process.*

Propositions 16 and 21 and 22 posit that communication during the recovery process follow on from pre-existing and general trends in the country of reference. Disasters rarely produce sudden and unexpected changes in society but rather accelerate trends that were already under way before the impact (Nigg and Tierney 1993). This finding also provides evidence for undertaking formative research on communication conduits and habits in the specific post-disaster setting before designing and implementing recovery communication strategies (Australian Red Cross 2010; World Bank 2010). Proposition 20 indicates that it is not possible to give a comprehensive definition of recovery, given that its stages depend on individual circumstances and on the occurrence of new events after the first emergency. Disaster literature argues that the recovery process rarely follows a neat linear pattern (Tierney and Oliver-Smith 2012) and that the pace of recovery differs according to one's socio-economic status, the severity of the physical damage experienced and the effects of pre-existing vulnerabilities (Nigg 1995; Fothergill et al. 1999). One consequence of this is that some people and groups can remain stuck in a recovery phase while others progress to subsequent stages. Rather than on the basis of the elapsed time, recovery phases should be defined through indicators that measure achievements in a geographical area or specific social groups (Contreas 2016). This argument provides further evidence of the restricted utility of mass communications during post-disaster reconstruction. Further research is needed in order to outline how recovery

communications strategies can be adapted using general recovery indicators, such as the level of physical damage.

6.4.2. Integration of regularities into existing communication literature and models

Communication scholars have often adopted a naturalistic approach to study communication practices as they unfold in real contexts (Frey et al. 1999). This research adopted a naturalistic paradigm because post-disaster reconstruction contexts offer a natural setting in which to study how communication practices play out under constraints of time, resources, distress and high demands and expectations (see section 3.2.1. and 3.2.2 on research ontology and design). In the disaster literature, communication theories and models have been applied widely. The interpretation of the patterns identified against established theories and models of communication enables one to read between the lines in search of peculiarities in recovery communication practices, which may be qualified by social media. For example, the variety and co-existence of the means of communication adopted by both authorities and citizens (Propositions 5 and 7) confirm the literature that advocates that traditional and on-line media are complementary in a specific domain (Dutta-Bergman 2004; see also Proposition 9). This is in opposition to the competition-based displacement theory (Dimmick and Rothenbuhler 1984), which posits that media compete with each other for resources. Furthermore, consistent with the ICT succession framework proposed by Stephens (2007), the combination of several communication channels to convey a message is believed to increase the effectiveness of communication. In the context of reconstruction, conveying messages through several means can reduce the complexity of communications.

Proposition 30 (P30): *During the reconstruction phase, traditional and on-line media work with similar communication functions. The use of a variety of communication methods increases the effectiveness of communication and reduces the complexity and uncertainty attached to the message.*

The variety of channels adopted by citizens provides support for 'media dependency theory' (Ball-Rokeach and DeFleur 1976), which posits that, in situations of crisis or profound change, increases in information needs result in an intensified dependency upon the media for information. Dependency on specific media depends on their ability to satisfy one's information needs and goals and on one's position in society (Ball-Rokeach 1985). Disaster studies have long applied media dependency theory to explain the intensification of information seeking from mass media during disasters and crises (Lowrey 2004; Hy et al. 2007, Jiang and Ouyang 2008). In this research, the dependency upon television and radio mass media seems to be reduced (Propositions 6 and 8) during PDR as result of their inability to fulfil information needs during this reconstruction phase.

Proposition 31 (P31): *During the reconstruction phase, dependency for recovery information upon mass media decreases while it increases for alternative media.*

The predominance of face-to-face communication between government officers is consistent with 'media richness theory' (Daft and Lengel 1984), which argues that, in highly uncertain and ambiguous situations, people choose the medium that offers the most richness in terms of social cues. According to this theory, rich media are better for tasks that are complex and ambiguous. By using face-to-face interactions, government officials strive to reduce the complexity and different interpretations of the message, and therefore the overall uncertainty produced by the post-disaster context. Conversely, as they are lacking of essential social cues, social media communications are more prone to be equivocal, and they therefore increase the levels of ambiguity and uncertainty.

Propositions 32 (P32): *In the context of reconstruction, government agencies and citizens prefer media that offer more richness in terms of social cues.*

Other research has highlighted the fact that media richness is a multidimensional construction (D'Ambra et al. 1998) and that, in the

absence of specific social cues, people adapt their interpersonal behaviour to the cues that remain available (see the 'social information processing model' of Walther 1992). Thus, on-line relationships can achieve the same level of intimacy as the ones that are created face to face (Riva 2002). Face-to-face interactions were more preferred by elderly people with low levels of education and employment status (see results from the Emilia-Romagna case study) and they are used more generally as a means of communication to interact with recovery officials (see interviews in the Canterbury case study). In order to receive information about the reconstruction, people who already engaged in social media groups gave preference to on-line media. This finding can be explained in the light of the 'uses and gratification theory' of Blumler and Katz (1974), according to which people actively choose the medium that best suits their needs, including the need for information-seeking, socializing, entertainment and status seeking. Arguably, for some people, social media satisfy all or part of these needs during the recovery process better than other media do. For example, social media play the role of emotional and support forums and hubs of information that are often more trusted than are the ones provided by official sources (Proposition 11). They can also be spaces in which people affected by disaster become leaders of information production and sharing (i.e., they seek status) or seek entertainment and escape from the distress of the post-disaster context. In other words, people turn to social media during the post-disaster reconstruction to fulfil other compelling needs for information, socialization and entertainment, rather than to engage in a conversation with recovery agencies.

Proposition 33 (P33): *People turn to social media during the recovery process to satisfy their need for information, socialization, status seeking, entertainment, and to escape from the distress of the post-disaster context.*

Both citizens and government agencies hesitate to adopt social media to communicate with each other. Citizens are wary of the trustworthiness of official communications, including those made through social media. Furthermore, interviews in New Zealand revealed that, as social media are a public forum, they were not an appropriate means of discussing

individual circumstances. From their own side, the authorities shared similar concerns over the appropriateness of social media for recovery communications and outreach coverage. They also complained about the fact that people use social media to express their discontent, anger and frustration. The 'identity model of deindividuation effects' (SIDE model) of Lea and Spears (1991) and the 'reduced social cues model' of Sproull and Kiesler (1986) provide support to this argument, suggesting that polarisation and in-group-out-group dynamics (i.e. in-group favouritism and out-group discrimination) become more evident on the Web and that people are inclined to behave more aggressively in on-line conversations. Thus, the frustration and anger that characterise the disillusionment phase of disaster recovery can be heightened in on-line groups and conversations.

Proposition 34 (P34): *As a consequence of deindividuation, the frustration and anger that characterise the disillusionment phase of disaster recovery can be heightened in on-line groups and conversations.*

In considering these drawbacks and pitfalls, government agencies and citizens are reluctant to embrace social media technology in order to collaborate and interact. The 'technology acceptance model' (TAM) of Davis (1989) and the 'theory of reasoned action' of Fishbein and Ajzen (1975) assert that a new technology is adopted when it is perceived as easy and useful to use and when it is believed to produce the desired positive outcome. Survey responses revealed that, despite having positive attitudes toward social media technology as a means of interaction, the authorities and citizens did not necessarily use social media for this purpose (Propositions 14 and 15). The reason for this is that they saw this technology neither as useful to achieve their objectives nor as necessarily having positive consequences.

Proposition 35 (P35): *Citizens and government agencies are reluctant to adopt social media during PDR because they see the adoption of this technology as having little utility for their purposes (interaction and collaboration) and as having potentially negative consequences.*

Despite the considerations aired above, the New Zealand Government used social media platforms with much more frequency for recovery communications than did the Italian Government. Looking at the dimensions of the Hofstede (1980) model for the comparison of the cultural dimensions of communication, New Zealand and Italy are shown to have similar levels of individualism (79 vs. 76), but the power distance (the strength of social hierarchy) and uncertainty avoidance dimensions are almost double in Italy with respect to their values in New Zealand. These two dimensions affect the likelihood that a country will accept innovations and adopt e-government services (Shane 1993). Arguably, these cultural dimensions also have effects on the frequency of usage of social media for recovery communications.

Propositions 36 (P36): *Cultural dimensions have effects on the frequency of usage of social media for recovery communications. Countries with lower levels of power distance and avoidance of uncertainty are more likely to adopt social media sites for communication during recovery.*

6.4.3. Integration of regularities into e-government and government 2.0 studies and models

In recent years, as a result of the increased use and expectations of responsiveness by citizens, government agencies have started to embrace social media (Mergel 2015), especially during emergencies (American Red Cross 2012). The adoption of social media platforms by government agencies represents an extension of e-government, in that the latter still focuses merely on service and programme delivery while the former has as a core component the interaction between parts (Mergel 2013b). Web 2.0 technologies can be seen as enablers of so-called 'Government 2.0' (Bonsòn et al. 2012), namely a “shift in the implementation of government toward an open, collaborative, cooperative arrangement where there is (wherever possible) open consultation, open data, shared knowledge and mutual acknowledgment of expertise” (AGIMO 2009). However, the way in which these platforms are used by government agencies varies considerably. While a majority still use them merely as an additional

communication and outreach channel in the same way as static websites (push technique), more mature applications include public engagement, in the form of bidirectional communication and pulling techniques, and networking, as the coproduction of knowledge. Mergel (2013b) suggested that social media might be able to enhance transparency and accountability through the provision of information, public participation through bidirectional interactions and collaboration between government and citizens through the co-production of knowledge).

In a similar vein, Lee and Kwak (2012) proposed an open government maturity model for social media-based public engagement that includes five levels: initial conditions (level 1), data transparency (level 2), open participation (level 3), open collaboration (level 4), and ubiquitous engagement (level 5). Arnstein's (1969) 'ladder of citizen participation' is mentioned in various studies on social media-enabled participation (Hand and Ching 2011; Stein 2013) and on community involvement in disaster risk reduction and recovery programmes (e.g. Davidson et al. 2007; Collins et al. 2011). As explained previously, the ladder is intended to account for the possible levels of citizens' participation in the decision-making, ranging from no involvement (the bottom rungs) to mere consultation (the middle rungs) to co-production of knowledge and social change (the top rungs). Looking at the results of the case studies, it is evident that, for the Italian authorities, social media still represent a mere outreach channel for the provision of recovery information and for enhancing transparency (informing rung on the Arnstein's ladder). In this sense, although it is mainly a static website, the '*OpenRicostruzione*' platform is emblematic of the effort to increase data transparency in post-disaster reconstruction. Similar efforts to increase transparency of disaster-related datasets were made after Typhoon Haiyan in the Philippines with the OpenReconstruction platform (<http://openreconstruction.gov.ph/>) and in USA with the portal Disasters.Data.Gov (<http://www.data.gov/disasters/>). As for the Canterbury case, modes of usage by recovery agencies appear to have been more advanced. They also encompassed bidirectional communication and harvesting ideas about recovery priorities from the

public (see the crowdsourcing and consultation campaigns run by various government agencies) (consultation and placation rungs of the Arnstein ladder). Less clear and evident is the extent to which crowdsourcing campaigns led to an actual coproduction of recovery policies.

Generally speaking, citizens' participation and involvement via social media in disaster reconstruction planning seem not to go beyond the information and consultation rungs of the Arnstein's ladder. Social media do not represent enabling platforms for full involvement of people in social and policy change processes. Allegedly, the differences in the usage modes between Italy and New Zealand can be attributed to two reasons: structured and clear guidelines for social media interactions produced by New Zealand Government in 2011 (di Maio 2011) (Proposition 22 on pre-disaster trends) and cultural attitudes that allow more openness to collaboration between authorities and citizens in on-line environments (i.e. less strength of social hierarchy and of uncertainty avoidance).

Proposition 37 (P37): *Cultural dimensions and prior establishment of clear guidelines have effects on the modes of usage of social media for recovery communications. Recovery agencies in countries with lower levels of power distance and uncertainty avoidance, and with established policies for social media interaction, are more likely to adopt social media for pulling information from their constituencies and communicating bi-directionally with them.*

Apart from cultural aspects and pre-disaster trends, the adoption of social media and e-government services depends also on the characteristics of the adopter. For instance, the diffusion of 'innovation theory' (Rogers 1995) posits that early adopters of new technologies in a society are typically wealthy and young people with high levels of education and income. This is confirmed by data from the Emilia-Romagna case study, which show that people with these characteristics receive and produce recovery communications as users of social media. However, other indices, such as perceived risk, perceived control and Internet experience, should be tested in future research.

At the organisational level, a leader's attitude toward change and the centralization and openness of the organization's structure (Rogers 1995) may determine an organisation's propensity to adopt social media. Level of innovation, technology and management capacity and influence of stakeholders (Oliveira and Welch 2013) also proved to be predictors of adoption. Although it is beyond the scope of this research, in relation to the factors mentioned above, an attempt was made to account for the variation in the adoption of social media by the government agencies surveyed. In contrast with what was found in the national statistics, in the Emilia-Romagna case study, the size of the municipality was not found to be associated with greater adoption of social media for recovery communications. For the Canterbury case study, level of innovation, e-government management and stakeholders' influence were tested as precursors. However, no relationship was found, probably due to the small number of respondents and the large size of most of adoption agencies surveyed. Large agencies maintained a communication department and a person who is designated to manage on-line services.

Traditionally, the use of social media by government agencies has been linked to diverse positive outcomes, including the development of a culture of transparency and openness (Bertot et al. 2010; Bonsòn et al. 2012), which, it is claimed, leads to greater trust in government agencies, especially in emergency situations (Covello 1992; Mishra 1996; Peters et al. 1997). As outlined by Propositions 13, 15 and 23, trust is a key determinant of the use of social media by citizens when they engage with recovery agencies. If the relationship stated above is true, more frequent and advanced uses of social media by recovery agencies to provide information transparently during PDR should correspond to greater trust in recovery agencies by citizens. However, results from the Canterbury earthquake case study contradict this statement. Although they were continuously informed and consulted via social media, people in the Canterbury region expressed high levels of distrust toward recovery organisations.

Trust is a complex and multidimensional construct, for which openness and transparency are only two of the possible determinants. Butler and Cantrell's (1984) model identified five characteristics of trust: integrity, competence, consistency, loyalty, and openness. Peters et al. (1997) found evidence that trust is dependent on perception of knowledge and expertise (competence), perception of openness and honesty, and perception of concern and care. Furthermore, many scholars have challenged the conceptualisation of transparency and trust as directly proportional constructs (Bannister and Connolly 2011). Grimmelikhuijsen (2010; 2012) conducted several experiments to test this relationship, finding evidence that people exposed to more transparent information were actually more negative about the perceived competence of the local government. Worthy and Grimmelikhuijsen (2012) compared the relationship between transparency and trust in the UK and Netherlands and found that this relationship was not only dependent on context (in fact, it was related to the national political culture), but was also specific to particular organisations (i.e., it was dependent on the level of government). In other words, trust is dependent upon multiple factors, some of which refer to the context and culture of reference, while others refer to characteristics of the person who trusts (such as a tendency to trust) and others to the (perceived) features of the person or agency that has to be trusted (i.e., perceived honesty, openness, consistency and competence).

The same could be said for recovery communications. The use of social media for collaborative engagement during PDR does not necessarily translate into greater levels of trust but may lead to a more nuanced and mediated relationship. However, this consideration draws on empirical data and observations rather than on proven causality. More research is needed in order to verify the statistical correlations between social media usage by government agencies and the effects on each dimension of trust by citizens.

Proposition 38 (P38): *The use of social media for community consultation during PDR does not necessarily translate into greater levels of trust, but may create a more nuanced and mediated relationship.*

Other models have seen trust as a precursor rather than a result of the adoption of e-government by citizens (Warkentin et al. 2002; Gilbert et al. 2004; Al-Adawi and Yousafzai 2005). According to Al-Adawi and Yousafzai (2005), “*given the uncertain environment of the Internet, trust and perceived risk are theorized as direct determinants of intentions*”. In post-disaster scenarios, it could be theorized that the uncertainty typical of the context heightens the need to trust the interlocutor in on-line communications. The role of trust in disaster communications and social-media mediated communications has been addressed widely (e.g. Renn and Levine 1991; Paton 2008; Tapia et al. 2011; Gultom et al. 2016).

6.5. Constructing the framework

By linking it to specific dimensions, the framework shown below (Figure 6.9) summarises the theoretical propositions presented above. Propositions that draw on systematic comparison of the findings from the case studies (an inductive approach) are presented with no highlight. Conversely, those built through an interpretation of the findings against established literature and models (the deductive approach), or on the analysis of a single case study, are highlighted in yellow. Rather than expressing direct and linear relationships between components, the framework clarifies variables and particular multiple influences and interdependencies. On the left side, the macro- and meso-level variables that are believed to affect communicative practices and social media usage during PDR are depicted in capital letters: culture, context and individual circumstances. The relationship between these dimensions and each component of the recovery communication system (source, message, channels, noise, receiver and effects) has only been observed empirically and should be tested statistically in future research. In this respect, the scope of the study was to compare observations and empirical data to derive testable propositions. The arrow next to the individual circumstances dimension represents the shift from mass communication to interpersonal communication modes during the recovery process. The box

at the centre of the figure includes the components of the communication system (depicted in bold). Theoretical propositions (in the brackets) are attached to each component and are connected via hyperlink to the propositions within the text. Theoretical propositions attached to the *source* component suggest that local governments play a primary role in the information provision function and that community-based groups work as a complementary source of information for citizens. The content of the messages refer mainly to the built environment and financial aspects of recovery. Interestingly the importance of these two dimensions remains unvaried across cultures, contexts and socio-demographic groups, suggesting that they are critical elements in all the reconstruction processes.

Looking at the channels, theoretical propositions highlight the fact that citizens and the authorities use multiple channels to communicate during recovery, and these include social media. Traditional mass media are less often used. Other propositions theorised why this is the case and why some channels are preferred over others. Community-based groups serve as both source and receiver of the G2C and C2G recovery communications. This research has not evidenced the *effects* of the communication practices by recovery agencies and citizens during disaster recovery. In the conclusion to this chapter, it is suggested that better and more advanced communication practices does not necessarily produce positive outcomes (i.e. greater trust). Social media usage is depicted as being part of the general communication practices. For the sake of clarity, composing elements (actors, barriers, motivation and noise) are represented in a separate box. The authorities see social media as additional communication channels, whereas citizens perceive them as informational hubs and emotional support forums. These platforms also help citizens to satisfy many compelling needs during the recovery process. However, multiple elements influence the decision on whether to engage in social media conversations by authorities and citizens.

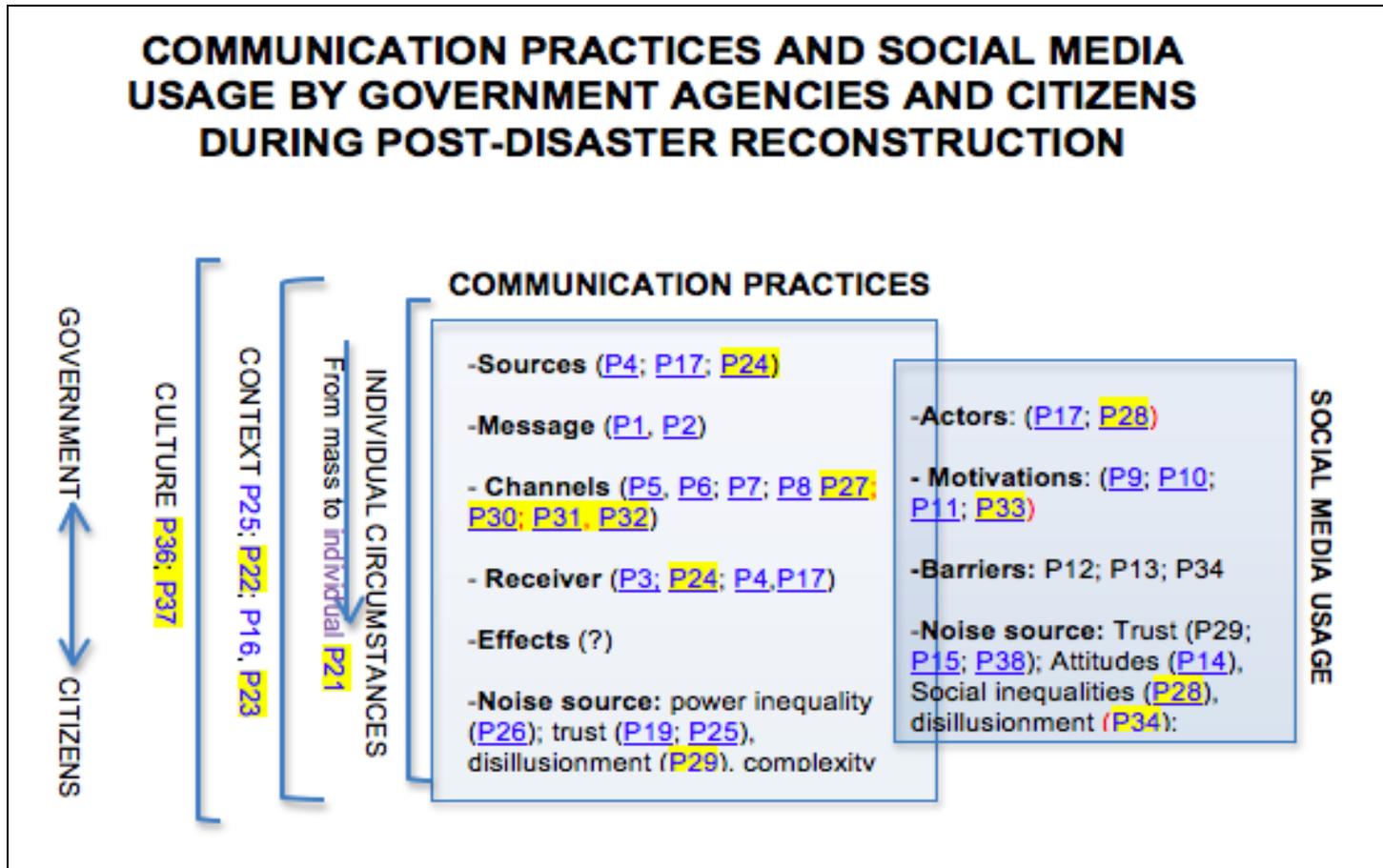


Figure 6.9. Framework of the communication practices and social media usage by government agencies and citizens during post-disaster reconstruction

6.6. Limitations of comparability and generalizability

The framework depicted above is affected by several limitations and therefore needs further verification. Limitations can be attributed to biases in *comparability* between the case studies, biases in the *approach* of the analysis (by case study) and biases in the *interpretation* of the results and *construction* of the theoretical propositions. Some limitations in comparability between case studies should be noted. For example, the type of areas affected (a set of small towns in Emilia-Romagna versus a city in New Zealand) may have had effects on the decision to centralise or decentralise the recovery management, impacting also on the network of actors involved in the recovery communications (small town councils versus a large agency) and on the adoption and maintenance of social media profiles. Although the same tool and type of analysis was used for both of the case studies, some elements of the tool were adapted to the specific context, thus potentially biasing the comparability. Cultural and social factors may have influenced the interpretation of similar concepts in the questionnaire. Other biases can be referred to the case study approach adopted in this research. The choice of the case study was based on the most similar system design that could be found (Przeworski and Teune 1970), which can limit the generalizability of the patterns identified to settings with different characteristics (Della Porta 2008). Further research is needed in order to verify whether the patterns can be extended to the recovery communications in diverse post-disaster settings (e.g., developing countries and countries with limitations of democracy).

The adoption of a case-based approach may also lead to limitations in generalizability. In such an approach, “*an in-depth knowledge of a small number of cases provides the basis for generalizations that are temporarily limited to the cases studied and whose wider relevance should be controlled through further research*” (Della Porta 2008, p. 208). Although

the choice of multiple case study design (Yin 1984) through cross-cases comparison brought more robust results, many limitations of case study research remain important. Other biases refer more generally to the interpretation of the results and the construction of the theoretical propositions. Some of the propositions on which the model is based are derived from the interpretation of patterns in the light of established models and theories. They therefore retain a speculative nature until they are proved in future research. The same could be said for propositions derived from the comparison between case study findings. Their generalizability and validity requires further testing. Lastly the correlation between variables and patterns is only hypothesized but not tested in this research. Future research must fill these gaps.

6.7. Re-setting the stage of the communication practices and social media usage during post-disaster reconstruction.

The next and final chapter is devoted to a discussion of the implications of the framework presented above and its contribution to existing disaster research. It also responds to the research questions posed by this study. Relationships between the variables identified will be discussed, and so will the newly emerging questions that future research should address.

Chapter 7

CONCLUSIONS

The central theme of this study is the investigation of communication practices and social media usage by government agencies and citizens during the post-disaster reconstruction phase. The answer to the research question was generated out of an in-depth naturalistic analysis of two post-disaster contexts, Italy and New Zealand. From a systematic comparison between the case study findings, a framework has emerged that describes the characteristics and interacting elements of the communication practices and social media usage during PDR. The framework responds to the research questions posed by this study and highlighted in Chapter 3.

Components of the recovery communication system (source, message, noise, channels) are interrelated and may vary according to individual, social, contextual and cultural factors. The dynamics of social media usage are part of general communication practices, to which they follow similar patterns. Model 1 (figure 7.1) depicts the dimensions of the communication practices and social media usage by government agencies and citizens during post-disaster reconstruction.

Model 2 (Figure 7.2) expands and explains the factors that influence the dimensions depicted in Model 1.

MODEL 1.

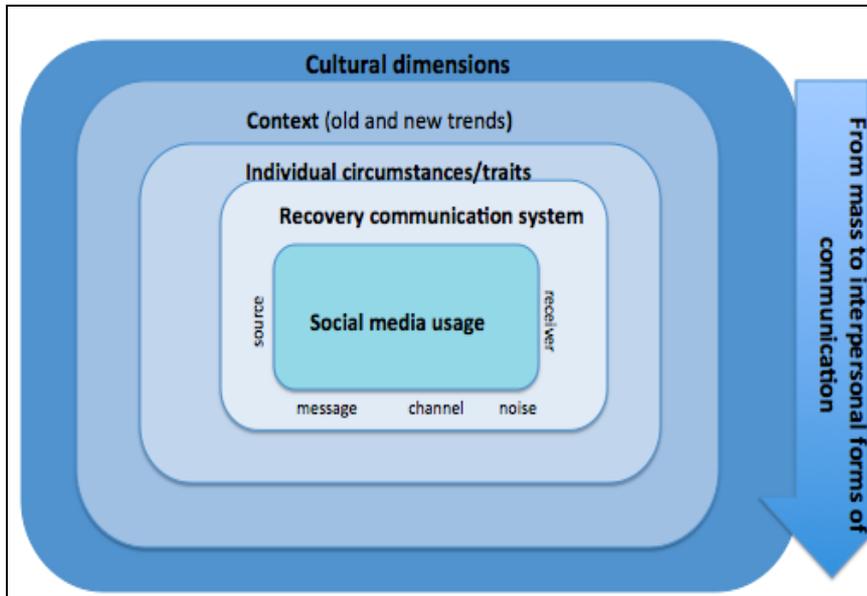


Figure 7.1. Dimensions of communication practices and social media usage during post-disaster reconstruction.

MODEL 2.

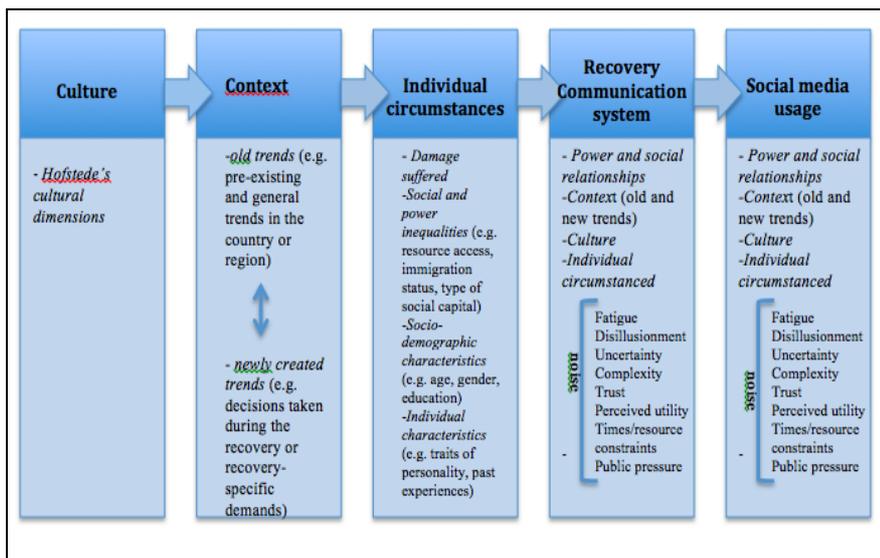


Figure 7.2. Influencing factors on the dimensions of the communications and social media usage during post-disaster reconstruction,

The cultural aspects of Hofstede's model are conceptualised as an overarching dimension that influences the context, individual levels and the components of the recovery communication system. The contextual level encompasses both the pre-existing and general trends in the country, as well as new patterns created by key decisions taken during the recovery (i.e., the type of recovery model adopted) and by the demands of the specific recovery process. In turn, old and new trends are expected to influence each other. For example, interviews in New Zealand revealed that the centralisation of power was already underway in the country prior the earthquakes and was accelerated and consolidated during the recovery process. It can be predicted that this model of recovery has further strengthened the role of central government actors and entities in New Zealand.

Interviews in New Zealand also revealed that the boundaries between disaster recovery phases are fuzzy, something that was noted in previous literature (Kates and Pijawka 1977). Rather than by the passage of time, recovery phases can be defined by individual indicators (Contreras 2016). The model presented above suggests that individual circumstances may drive information needs during disaster recovery and consequently may influence the recovery communication system. However, directionality and modes of influence remain unclear. Level of economic wealth and physical damage proved to explain differences in recovery experiences (Chang 2010) as well as resource availability and pre-disaster trends (Kates 1977) and external assistance received by households (Wang et al. 2012). Aldrich (2010) argued that social capital was the strongest predictor of people's recovery after a disaster. However, determinations of successful recovery may vary depending on the unit of analysis (i.e., individuals, households, neighbourhoods, the city, the region, etc., Jordan and Javernick-Will 2013).

Other individual characteristics proved to act upon communication preferences. For example, demographic variables such as age, gender

and level of education act upon the decisions to adopt certain means of communication over others (Spence et al. 2006; Burke et al. 2010; Feldman et al. 2016). Traits of personality and familiarity with communication methods influence the level of dependency upon different media outlets when seeking for information (Rice and Case 1983; Hy et al. 2007; Butt and Phillips 2008; Ross et al. 2009). Although the effect of individual circumstances is more evident for citizens' communications, official communications should adapt their strategies accordingly.

Future research should test out whether different levels of recovery within a population and different individual circumstances generate diverse information and communication needs, and how communication strategies can adapt to these variations.

Cultural, contextual and individual dimensions influence the recovery communication system. There are also disturbing effects that the recovery process produces, such as complexity of messages, uncertainty, fatigue, trust issues, disillusionment, frustration, perception of the utility of the means of communication, and constraints of time and limited resources. Social media usage intersects with the elements of the recovery communication system and is influenced by similar variables.

The framework and the models presented in this dissertation expand existing knowledge about post-disaster reconstruction in the sense that they:

- shed light on neglected aspects of the disaster recovery process
- highlight theoretical propositions that, if further verified, can provide the basis for generalizable knowledge
- unravel some of the variables that influence communication practices and social media usage during disaster reconstruction

- interpret trends in recovery communications in the light of the disaster literature, communication studies and e-government scholarship, thus outlining a meeting point between these disciplines
- open new research questions that future studies can explore.

Past research on disaster recovery is patchy in nature. Knowledge about recovery processes has been built one case study at the time without taking a long-term and comparative view (Reiss 2012; Twigg 2015a). Furthermore, it has failed to account for the influence of global trends and societal conditions on recovery dynamics (Tierney and Oliver-Smith 2012). This research makes its contribution to knowledge by looking at the interconnections between recovery communication dynamics and the characteristics of the broader context in which they occur. It then strives to go beyond the single context by looking at regularities that could be generalisable and expandable to other post-disaster settings.

The framework outlined in Chapter 6 and the models presented here can be criticised for not fully proving the relationships between the concepts. This project purposefully adopted a naturalistic paradigm (Lincoln and Guba 1985) and a case-oriented design (Ragin 1987). As such, empirical knowledge emerging from field observations did not seek to prove correlations between variables. Instead, it strove to describe and explain a complex unit of analysis (Della Porta 2008), namely *a social phenomenon that naturally occurs in a context*. Correlations between variables were not deliberately sought and any single variable was thought to correlate at multiple levels with other variables. Naturalistic inquiry produces context-bounded working hypotheses, in which each “*action may be explainable in terms of multiple interacting factors, events, and processes that shape it and are part of it*” (Guba and Lincoln 1982, p. 238). As such, each case study aimed to provide a snapshot of the interplay of these variables within a specific context.

In its traditional form, naturalistic inquiry rejects the generalisation of knowledge beyond the context of analysis (Guba and Lincoln 1982). However, many authors have challenged the assumption that qualitative research designs could not produce generalizable knowledge (Firestone 1993; Lewis and Ritchie 2003; Mayring 2007). This project strove to move beyond the uniqueness of each recovery process towards the search for the general patterns (see section 3.2.2.). As happens frequently when analysing naturalistic data, differences were greater than similarities. About the regularities, one question remains open:

Research Question 1 (RQ1): *To what extent can the regularities identified and the theoretical propositions built upon them be transferred to other settings, samples, times and situations?*

Future research can purposefully validate one or more of the propositions in the framework by verifying their applicability to diverse contexts, settings and samples. For example, past research showed that the type of disaster determines information seeking behaviour, as well as the information source used during response (Liu et al. 2014; Schultz et al. 2011). The 'situational crisis communication theory' (Coombs 2007) posits that communication strategies should vary according to the type of crisis. Future research should verify whether this is the case also during reconstruction processes that occur after diverse disaster types.

Different contexts may also engender diverse information needs and information seeking behaviours. For example, the geographical context of residence can determine the accessibility to information and communication infrastructures and the reliance on informal social networks to meet informational needs. However, Dutta (2009) demonstrated that differences in information needs and access in developing countries largely depended upon disparities in education and income, rather than on the geographical area of residence (Dutta 2009). This study suggests a requirement for further research to verify whether differences in information

needs during the recovery process reflect geographical disparities (such as developed versus developing countries) or instead mirror social disparities (i.e., the wealthy versus the poor).

Research Question 2 (RQ2): *Do the differences in information needs during the recovery process reflect geographical disparities (i.e., developed versus developing countries) or do they instead mirror social disparities (i.e., the wealthy versus the poor)?*

Looking at the role of context in recovery communications is a fruitful research area, although it may conceal some pitfalls. For instance, when analysing recovery processes, one should be able to differentiate clearly between pre-existing trends (exogenous factors) and the effects of the disaster (endogenous factors, Chang 2010). In the model proposed in this study, context was broken down into two composing elements: pre-existing and general trends in the country (the exogenous factor) and the model of recovery applied (the endogenous factor). Both of these factors were predicted to influence some aspects of the recovery communication system, including the use of social media platforms. However, the model also predicated a reciprocal influence between them. Pre-existing and general trends are believed to drive the choice of recovery model and, in turn, this can accelerate and exacerbate existing trends. Future research should examine the influence of interactions between exogenous and endogenous factors on recovery communications.

Research Question 3 (RQ3): *How do exogenous factors such as pre-existing and general trends and endogenous factors such as the effect of disasters and key decisions upon the recovery influence recovery communication strategies and methods?*

Cultural effects on recovery communications represent another important issue. In this study, it was noticed that cultural aspects might impact the propensity to adopt social media for recovery communications. However,

they can also determine the ways in which recovery information is communicated. For example, Hall's model (1976) accounts for the differences in high-context versus low-context cultures. In high-context cultures, many of the messages remain implicit and the rest of the meaning is added by the context. Conversely, in low-context cultures, the message is clear and explicit. Future research should explore the effects of the cultural dimensions of Hofstede's (1980) and Hall's (1976) models on recovery messages and communication channels.

Research Question 4 (RQ4): *What are the effects of the cultural dimensions of Hofstede's and Hall's models on the recovery communication system and on social media usage?*

Further research is also needed concerning factors such as trust, uncertainty and disillusionment that influence the recovery communication system and social media usage at various levels. Each of these factors should be decomposed into its constitutive elements. Each element can then be tested for correlation with the components of the communication system.

Research Question 5 (RQ5): *How do factors such as trust and uncertainty disturb the components of the recovery communication system and the usage of social media during PDR?*

This research was mainly concerned with looking at communications between government agencies and citizens. Yet the recovery communication landscape encompasses actors other than public sector organisations and affected individuals, including non-governmental and quasi-governmental organisations, emergent groups, international relief organisations and non-profit relief organisations (Smith and Birkland 2012). Through interactions, these stakeholders shape the outcomes of the recovery process and determine the levels of success of recovery communication initiatives. For example, this research highlights the central

role played by emergent and formal organisations as amplifiers and brokers of G2C and C2G communications. How informal networks and other more or less formal actors interact to determine the ways in which recovery information is provided, received and elaborated is a matter that future research should explore.

Research Question 6 (RQ6): *How do informal networks and other stakeholders influence G2C and C2G communication as part of disaster reconstruction and recovery communications in general?*

Table 7.1 summarises the research areas of recovery communications and social media usage that this study has opened up.

It is important to highlight the aspects that the framework and the models *do not* account for. For example they do not delve into the role of bonding ties and informal networks in receiving and sharing recovery information. Interpersonal interactions with friends, relatives and acquaintances proved to be an important information source during crises and disasters (Burke et al. 2010).

It is reasonable to argue that recovery information as well is passed on through the distributed network of family and friendship ties.

Another criticism that may be raised is that the findings reflect power relationships in society. Data about information and communication needs during reconstruction were collected among the members of community groups, who are generally wealthy and well educated. The paradox here is that the research uncovered the pitfalls of the G2C communications that tend to target more powerful groups but it falls exactly into the same trap. One exonerating point is that having to deal with a large amount of complex data in two different contexts was already challenging. Targeting marginalised groups and individuals, who are also the hardest to reach, would have rendered the entire work unmanageable in terms of the time and resources required.

Table 7.1. *Research areas in need to be further explored in the distribution.*

Research area	
Role of cultural dimensions	How Hofstede's and Hall's dimensions affect recovery communications and social media usage
Role of contextual dimensions	How the interactions between exogenous and endogenous contextual factors influence recovery communications and social media usage
Role of Individual circumstances	How recovery indicators, socio-demographic characteristics and personal traits act upon the recovery communication system
Role of pre-existing social and power inequalities	How power and social inequalities are distributed and how this distribution influence information and communication needs
Role of other actors in the G2C and C2G recovery communications	How other recovery actors (i.e. family and friends) contribute to the recovery communication landscape
Information and communication needs of marginalized people	How vulnerable and underserved communities receive information and which type of information are most needed
Evolution of recovery communications	Constructing a timeline on how recovery communication and social media usage evolve over the reconstruction.

Another point is that an attempt was indeed made to include people from less powerful groups by distributing the questionnaires by hand through community groups. The effort had some success in the Emilia case study but did not work in Canterbury due to the fact that community groups did not collaborate.

The study endeavours to account for the changes in the recovery communications during an extended timeframe. However, interviewees in New Zealand were neither able to identify clearly the shift from one

recovery phase to another nor recall how the communications changed over the time. This was probably due to the fact that the definition and duration of each phase varied between people and localities. Another possible explanation is that in-depth interviews are not appropriate ways of eliciting memories about the evolution of a situation. For example, Sword-Daniels et al. (2016) used a timeline to construct a chronicle of changes to the healthcare system after the Montserrat eruption in the West Indies. Furthermore, longitudinal studies might best suit the purpose of capturing the evolving nature of recovery needs and demands (Norris et al. 2006; Phillips 2014). Lastly, the models try to explain field observations in the light of diverse streams of literature, namely, disaster recovery and reconstruction studies, communications scholarship and e-government literature. Each of these streams is overabundant with data and is composed of several sub-branches and sub-streams. Thus, important aspects might easily have been missed.

The models and theoretical propositions summarised in the framework have important implications for policy. Reports produced by international organisations and governments (e.g. World Bank 2010; Australian Red Cross 2010) offer some valuable guidelines on the development of effective communication strategies during reconstruction. They highlight the importance of adopting multiple communication methods and implementing two-way communication mechanisms. However, they offer almost no practical knowledge. Little empirical evidence is provided about how to achieve good integration between communication methods in real post-disaster settings. Little reference is made to the implications of the constraints and challenges created by recovery processes on the communication practices and on the choice of communication methods. High-level guidelines do not help government officers in the practical implementation of strategies or prepare them for the issues they are going to face during implementation.

Conversely, the framework and models presented here outline evidence-

based knowledge that originated in real reconstruction settings, which government officers can further verify in relation to their own context. Capitalising on theoretical literature and field observations, they provide detailed descriptions of the dynamics and issues of recovery communication. They investigate and make evident underlying influences that decide on the adoption of particular communication mechanisms. In doing so, they open up a reflective space for the revision of these mechanisms and their improvement. For example, government officers should be made aware of the driving forces that act upon powerful groups' interests and informational needs during PDR. Thereafter, they should be trained and supported in opposing these forces and reaching out to underserved communities (Lachlan and Spence 2011).

The framework insists on the importance for government agencies of partnering with community-based groups, which often represent a source of recovery information for citizens that is more authoritative than are official agencies. Awareness should be raised about the interdependencies between dimensions and components of the recovery communication system. In real post-disaster settings it is difficult to establish linear relationships between one action and one outcome. Rather, an outcome results from the intersection between the multiple actions and choices of multiple actors. For example, policies and guidelines suggest that the implementation of two-way communication mechanisms helps build trusting relationships with the affected population. Empirical knowledge shows that trust is a multidimensional process rather than an outcome (Khodyakov 2007). It needs to start out prior to the impact of the disaster and must be nurtured throughout the emergency period. In New Zealand, despite the implementation of complex consultation campaigns, the sense of trust toward official communications was diminished by perception of lack of transparency and of the exclusion of the citizens from key decisions in the initial stages of the recovery, such as decisions about re-zoning. Effective recovery communication strategies need to be built *ex ante* on

the knowledge of the targeted population and on the positioning of the agency as a trusted source of information and *ex post* on a recovery planning that takes into account people's feedback and expectations.

The framework of this study also informs one about citizens' information and communication needs during PDR. The study has adopted a communication-with-communities (CwC) approach. The communicating with disaster-affected communities (CDAC) network provides toolkits to help officials of NGOs and government collect insights into communication behaviours that are underway in the impacted population during response to crises and disasters worldwide. Due to the lack of data about information and communication needs at long term after a disaster, the framework proposed in this dissertation uses a CwC approach to fill the knowledge gap. It therefore provides a valuable tool to help recovery agencies understand what information people seek, through which channels and from which sources they seek it, and what the role of social media sites is in sharing information on recovery. Communities could use this knowledge to improve their own communication practices, call for changes in the communication strategies by government agencies and set out community-led communication initiatives.

In the final analysis, I would like to outline the new vision for disaster recovery research and practice that this project strives to bring into being. Recovery is a complex and multifaceted process, which extends over many years. It is prone to influences that derive from the past, the present and the future and to the actions and interactions of many diverse actors and events. For the sake of operationalising these elements in the form of variables, disaster research has often been forced to overlook certain elements and oversimplify reality. This is certainly relevant and downright necessary in many cases. However, past research has endured this limitation and has fallen short in digging into the complementary aspects that studies have been forced to overlook. The result is a series of studies that have tackled similar issues but have failed to tackle the root causes of

what was being observed. In its own way, this research project has striven to deal with the multidimensional nature of recovery communications and social media usage. It has tried to take a simultaneously broad and detailed view of the recovery contexts, in the awareness that both perspectives are needed. By using a comparative methodology, it has sifted through recovery communication dynamics in search for regularities that could indicate generalisable knowledge upon which a theory of recovery communication could be founded. It has then capitalised on the established literature that, although developed in different knowledge domains, could contribute to the interpretation of the results. Though ambitious projects bring along a higher risk of failure, studies that are able to manage complexity and uncertainty are needed in order to analyse complex environments such as recovery contexts. Eventually, eschewing complexity for the purpose of staying on the safe side will lead to a biased, and thus potentially distorted, vision of how the recovery process works. Future studies of disaster recovery and reconstruction should endeavour to be more ambitious, multidimensional, multilayer, heterogeneous and interconnected with other research and knowledge fields.

Looking at the recommendations for practice, this research offers food for thought for different actors. For example, for disaster managers it is an invitation to acknowledge that their expertise and work does not finish with the end of the emergency and early recovery period. Although much of the reconstruction work is managed and executed by local and national authorities, these should be continuously shadowed in their efforts by experts in disaster risk reduction and disaster recovery and reconstruction. Too often, the authorities are left alone to deal with a process they know little to nothing about. This makes communicating about, and engaging citizens in, the reconstruction process even more difficult because it increases the uncertainty and the risks embedded in the whole process. Training should be provided to local authorities to cope with community needs (Stehr 2001), ideally starting before the disaster occurs as part of

pre-disaster recovery planning, and continuing afterwards with regular follow-ups.

For government officials working on reconstruction, this research should offer a space for reflection on their own communication practices and how these are influenced by power structures transmitted through linguistic modes. In other words, it uncovers hidden patterns and helps officials to give prominence to questions such as how relevant for citizens is the information provided? Which social groups remain unreached and why, and are there alternative methods of engagement for certain groups? How does the medium influence the perception and elaboration of the information provided? Is the medium the message? (See McLuhan et al. 1967; Schultz et al. 2011) How can the potentialities offered by new communication technology be fully exploited during disaster recovery and what challenges exist? The two case studies also make evident that the community should not be regarded as a homogenous entity, and that different communication strategies and modes of engagement should be studied and implemented (Palttala et al 2012; Twigg 2015b). They also suggest that officials should start community engagement and knowledge before disaster strikes.

Lastly, citizens should benefit from this research by gaining awareness of the big picture behind their individual recovery circumstances and issues. Interviews in New Zealand highlighted that lay citizens are interested to understand why certain recovery aspects are prioritised over others. The awareness of the dynamics and forces that drive the recovery process, including patterns of communication, might have empowering effects and help citizens to take informed decisions and shape their own and the community's future during recovery from disaster.

Appendices: Questionnaires

QUESTIONNAIRE FOR RESIDENTS (CANTERBURY VERSION)

<p>Do you work for an official agency involved in the reconstruction of the Canterbury region? (e.g. CCC, SCIRT, CERA, Fletchers, etc.)</p>	<p>YES/NO</p>
<p>Were you in the areas affected at the moment of the Canterbury earthquake of February 2011?</p>	<p>YES/NO</p>
<p>Do you live in a city/town/village where the reconstruction is still underway?</p>	<p>YES/NO</p>
<p>How often do you use social media (e.g. Facebook, blog, Twitter etc.)</p>	<p><input type="checkbox"/> every day; <input type="checkbox"/> several times in a week; <input type="checkbox"/> several times in a month; <input type="checkbox"/> several times in six months;</p>
<p>1.What kind of information have you tried to obtain from recovery agencies during the reconstruction phase? Please select the most relevant information (MAXIMUM THREE ANSWERS).</p>	<p>1. Debris Management 2. Environmental risks related to the earthquake and/or to the reconstruction; 3. Historic and cultural heritage preservation; 4. Housing and infrastructure reconstruction; 5. Business and industries recovery; 6.Funds/refunds; 7. Psychosocial support; 8. New agencies and policies created after the earthquake; 9. Use of donations; 10. Volunteering and events related to the reconstruction; 11. Damage assessment; 12. Community groups and associations' activities; 13.</p>

Educational and health services; 14. Traffic plans and public transportation; 15. Other (Please specify)

2. How often have you used the following channels to provide to the citizens the information selected in the question 1?

Channels: Internet (email and website), Social media (Facebook, Twitter, Blogs, Youtube etc.), Face to face interactions, Phone (calls, texts), Paper material (newspapers, brochures, posters etc.), Television, Radio.

Answer options: 1. At least once a week; 2. At least once a month 3. Few times in a year 4. Never

3. Which agency/agencies or authority/authorities did you use to look for the information selected in the question 1? Select all the appropriate answers.

1 City Council; 2. District Council; 3.SCIRT; 4.Nominate repair company, e.g. Fletchers; 5. EQC – the Earthquake Commission; 6. Environment Canterbury; 7.CERA; 8. Ministries; 9. District Health Board; 10.Fire services; 11. Police services; 12. Other (please specify)

4. We are going to present you different statements. Please tell us to which extent you agree with each statement.

1. I think that social media (Twitter, Facebook, blogs, Youtube, etc.) are very important tools to have a two-way conversation with authorities on issues or topics related to the reconstruction

2. I trust what authorities say on social media regarding the reconstruction.

3. I think that the social media are more useful for organizing off-line activities with other citizens in the reconstruction phase than supporting the communication between authorities and residents.

4. I think that authorities are willing to use social media to have a two-way communication with citizens on topics and

issues related to the reconstruction.

5. I often discuss general political and social issues via social media

6. I think that local authorities are more willing than national ones to use social media to discuss with citizens issues related to the reconstruction with residents

7. I think that social media are useful tools to develop a two-way conversation with the authorities regarding reconstruction topics

Answer options: Strongly disagree- Somewhat disagree- Neutral- Partially agree- Fully agree-

5. Please select the main reasons for which you have used social media during the reconstruction phase from the Canterbury earthquake (MAXIMUM TWO ANSWERS). If you are not a social media user, you can skip this question.

1. to read information on issues and topics related to the reconstruction; 2. to post comments, queries or complaints on issues and topics related to the reconstruction; 3. to encourage other citizens to take part in civic off-line activities related to the reconstruction; 4. to contact an authority directly and request information related to the reconstruction; 5. to engage in two-way communication with authorities on issues and topics related to the reconstruction; 7. to collaborate with an authority in the resolution of specific issues related to the reconstruction; 8. I have not used social media for goals related to the reconstruction; 9. Other (please specify)

6. Which barriers have you encountered to the use of social media to communicate with authorities during the reconstruction phase (MAXIMUM TWO ANSWERS)? If you have had no problem, you can

1. I can't afford to buy a computer and/or to have a broadband connection; 2. I have physical problems in accessing to IT infrastructures; 3. I'm concerned about privacy issues; 4. I prefer using social media for other purposes; 5. I don't have the IT competencies to use social media to discuss with authorities; 6. I don't have enough

specify it. All respondents should answer this question. time to dedicate to on-line discussion with authorities; 7.I do not trust the authorities ; 8.I live in an area without broadband and/or with difficult access to IT infrastructures; 9.I think that the authorities do not use social media to communicate with citizens; 10.I have had no problem; 11.Other (Please specify)

7. Have you used social media to have a two-way communication with government officers during reconstruction phase from the Canterbury earthquake of February 2011?

YES/NO

8. If yes, which social media have you used for this purpose? (Select all the appropriate answers)

1.Twitter; 2.Youtube; 3.Facebook; 4.Google plus; 5.Blogs; 6.Websites created with the specific goal of supporting the reconstruction process; 7.Forums within institutional websites; 8.Other (specify)

QUESTIONNAIRE FOR GOVERNMENT OFFICERS (CANTERBURY VERSION)

Do you work for an official agency involved in the reconstruction of the Canterbury region? (e.g. CCC, SCIRT, CERA, Fletchers, etc.)

YES/NO

How often do you use social media (e.g. Facebook, blog, Twitter etc.) within your agency?

every day; several times in a week; several times in a month; several times in six months;

1.What kind of information have you provided to the citizens during the reconstruction phase? Please select the most relevant options (MAXIMUM THREE OPTIONS)

1.Debris Management 2. Environmental risks related to the earthquake and/or to the reconstruction; 3. Historic and cultural heritage preservation; 4. Housing and infrastructure reconstruction 5. Business and industries recovery; 6. Funds/refunds; 7. Psychosocial support; 8. New agencies and policies created after the earthquake; 9. Use of donations; 10. Volunteering and events related to the reconstruction; 11. Damage assessment; 12. Community groups and associations' activities; 13. Educational and health services; 14. Traffic plans and public transportation; 15. Other (Please specify)

2. How often have you used the following channels to provide to the citizens the information selected in the question 1?

Channels: Internet (email and website), Social media (Facebook, Twitter, Blogs, YouTube etc.), Face to face interactions, Phone (calls, texts), Paper material ((newspapers, brochures, posters etc.), Television, Radio.

Answer options: 1. At least once a week; 2. At least once a month 3.Few times in a year 4. Never

3. To which groups of citizens were directed the information selected in the question 1? Select all the appropriate answers.

1.All citizens; 2. Homeowners; 3. Couples with underage children; 4. Adolescents (11-18 years old); 5. Heads of household; 6.Elderly people; 7. People with disabilities; 8. Business people; 9.Immigrants or ethnic minorities;; 10. Members of community groups and associations; 11. Other (please specify)

4. We are going to present you different statements. Please tell us to which extent you agree with each statement.

1. I think that social media are very important tools to discuss with citizens on issues or topics related to the reconstruction

2. Authorities should use social media to discuss general political or social issues with the citizens

3. To discuss issues or topics related to the reconstruction on social media with the citizens might lead the authorities being liable for litigation;

4. To discuss issues or topics related to the reconstruction on social media with the citizens, might lead to a spread of false or inaccurate information

5. I think that the citizens have the knowledge and skills to discuss issues and topics related to the reconstruction with the authorities via social media.

6. I think that there are other tools more useful than social media to discuss with citizens on issues or topics related to the reconstruction

7. I think that the information collected from citizens via social media on the reconstruction's requirements, could be collected elsewhere without the need to interact with citizens (e.g. reports from other organizations on the field, historical and demographic data etc)

a. My agency has a strong commitment to innovation.

b. Employees in this agency are rewarded for developing innovative solutions to problems.

Answer options: Strongly disagree-
Somewhat disagree- Neutral- Partially agree-
 Fully agree-

5. Please select the main reasons for which you have used social media during the reconstruction phase from the Canterbury earthquake (MAXIMUM TWO ANSWERS). If you are not a social media user, you can skip this question.

1. to post information on issues and topics related to the reconstruction; 2. to answer to citizens' queries and complaints on issues and topics related to the reconstruction; 3. to ask citizens for their opinions on issues and topics related to the reconstruction; 4. to ask citizens to collaborate with the authorities in order to resolve issues related to the reconstruction; 5. to ask citizens to organize petitions and propose ideas in order to establish new laws and policies about the reconstruction; 6. I did not use social media to communicate with citizens regarding topics related to the reconstruction; 7. Other (please specify)

6. Which barriers have you encountered in the use of social media to communicate with citizens during the reconstruction phase (MAXIMUM TWO ANSWERS)? If you have had no problem, you can specify it. All respondents should answer this question.

1. I am concerned about security issues; 2. My agency does not have official policies and guidelines for the use of social media to discuss with citizens; 3. My agency is not embracing these tools because of the costs of implementation; 4. I don't have the IT competencies to use social media to discuss with citizens; 5. My agency is not embracing these tools because of the lack of personnel to employ in the on-line discussions with citizens; 6. I don't have the time to dedicate to discuss on-line with

citizens; 7. My agency is not embracing these tools because it has other priorities; 8. I think that social media are not useful to discuss with citizens; 9. I am concerned about potential legal problems for me and/or my agency; 10. The policies of my agency prohibit the use of social media at work; 11. I have had no relevant problems; 12. Other (please specify)

7. Have you used social media to have a two-way communication with citizens during reconstruction phase from the Canterbury earthquake of February 2011?

YES/NO

8. If yes, which social media have you used for this purpose? (Select all the appropriate answers)

1. Twitter; 2. Youtube; 3. Facebook; 4. Google plus; 5. Blogs; 6. Websites created with the specific goal of supporting the reconstruction process; 7. Forums within institutional websites; 8. Other (specify)

List of References

Action Aid 2014. *Se l'Italia tornasse a tremare? Lezioni dal terremoto in Emilia-Romagna*. Action Aid online report. Retrieved on March 4, 2017. Available at: <https://www.actionaid.it/informati/pubblicazioni/se-litalia-tornasse-a-tremare-lezioni-dal-terremoto-in-emilia-romagna>

Adams, W.C. 1986. Whose lives count? TV coverage of natural disasters. *Journal of Communication* 36(2): 113-122

Adamski, S. 2013. *Crowdsourcing Disasters and Social Engagement Multiplied*. Blog post online since August 05, 2013. Available at: <http://www.whitehouse.gov/blog/2013/08/05/crowdsourcing-disasters-and-social-engagement-multiplied>

AGIMO 2009. *Engage: getting on with Government 2.0*. Australian Government Information Management Office report. Retrieved on July 29, 2015. Available at: <http://www.finance.gov.au/publications/gov20taskforcereport/doc/Government20TaskforceReport.pdf>

Ainsworth, M. 2015. For a locally led recovery, change the bill. *Stuff*. Published on December 3, 2015. Available at: <http://www.stuff.co.nz/the-press/business/the-rebuild/74702232/For-a-locally-led-recovery-change-the-bill>

Akkaya, C., P.Wolf and H. Krcmar 2012. Factors Influencing Citizen Adoption of E-Government Services: A cross-cultural comparison (Research in Progress). Paper presented at the *2012 45th Hawaii International Conference on System Sciences*, 4-7 January 2012, Maui, HI, USA

Al-Adawi, Z. and S. Yousafzai 2005. Conceptual Model of Citizen Adoption of E-Government. Paper Presented at the *Second International Conference on Innovations in Information Technology (IIT'05)*, Dubai, United Arab Emirates

- Al-Hujran, O, M. Al-dalahmeh and A. Aloudat 2011. The Role of National Culture on Citizen Adoption of eGovernment Services: An Empirical Study. *Electronic Journal of e-Government* 9(2): 93 – 106
- Aldrich, D.P. 2010. Fixing recovery: Social capital in post-crisis resilience. *Journal of Homeland Security* 6:1–10.
- Aldrich, D.P. 2013. Rethinking Civil Society-State Relations in Japan after the Fukushima Incident. *Polity* 45: 249-264.
- Alessio, G., L. Alfonsi, C.A Brunori, P. Burrato, G. Casula, P. Vanoli, A. Venuti and P. Villani 2012. Technologies and new approaches used by the INGV EMERGEO Working Group for real-time data sourcing and processing during the Emilia-Romagna (Northern Italy) 2012 earthquake sequence. *Annals Of Geophysics* 55(4) doi: 10.4401/ag-6117
- Alexa 2011. *Top Sites in New Zealand*. *Alexa.com*. Online report published on 10 January 2011. Retrieved on 11 May 2017. Available at: <http://www.alexacom/topsites/countries/NZ>,
- Alexa 2016. "Top Sites in New Zealand", Top Sites in New Zealand", <http://www.alexacom/topsites/countries/NZ>
- Alexander, D. 1980. Florence floods--what the papers said. *Environmental Management* 4: 27-34
- Alexander, D. E. 2000. *Confronting Catastrophe: New Perspectives on Natural Disasters*. Harpenden, UK: Terra Publishing, and NewYork: Oxford University Press
- Alexander, D. 2004. Planning for post-disaster reconstruction. Paper presented at the *I-Rec International Conference 'Improving Post-Disaster Reconstruction in Developing Countries' 2004*, April 22-23, Coventry, UK.

- Alexander, A. 2005. Towards the development of a standard in emergency planning. *Disaster Prevention and Management: An International Journal* 14(2), 158-175.
- Alexander, D. 2012. An evaluation of medium-term recovery processes after the 6 April 2009 earthquake in L'Aquila, Central Italy. *Environmental Hazards* 12(1): 60-73
- Alexander, D. E. 2010. The L'Aquila Earthquake of 6 April 2008 and Italian Government Policy on Disaster Response. *Journal of Natural Resources Policy Research* 2(4): 325-342
- Alexander, D.E. 2013. Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth Systems Science* 13: 2707-2716
- Alexander, D. 2003 Towards the development of standards in emergency management training and education. *Disaster Prevention and Management: An International Journal* 12(2), 113-123
- Ali, M., V. Weerakkody and R. El-Haddadeh 2009. The Impact of National Culture on E-Government Implementation: A Comparison Case Study. *Proceedings of the Fifteenth Americas Conference on Information Systems, San Francisco, CA: IEEE Press* <http://aisel.aisnet.org/amcis2009/137>
- All Right 2014. *A Summary of the "All Right?" Campaign Research Findings*. "All Right?" online report. Retrieved on January 16, 2017. Available at: http://www.allright.org.nz/media/uploads/AllRightResearchSummary_1.pdf
- Altheide, D.L. 1994. An ecology of communication: Toward a mapping of the effective environment. *The Sociological Quarterly* 35(4): 665-683

Amaratunga, D. and D. Baldry 2001. Case study methodology as a means of theory building: performance measurement in facilities management organisations. *Work Study MCB University Press* 50(3): 95-104.

American Red Cross 2012. *How Americans use social media tools in emergencies*. American Red Cross online report. Retrieved on 10 December, 2016. Available at: <http://www.redcross.org/news/press-release/More-Americans-Using-Mobile-Apps-in-Emergencies>

Anderson, W.A. 1969. Disaster Warning and Communication Processes in Two Communities. *Journal of Communication* 19:92-104

Anthony, K.E., T.L. Sellnow and A.G. Millner 2013. Message Convergence as a Message-Centered Approach to Analyzing and Improving Risk Communication. *Journal of Applied Communication Research* 41(4): 346-364

Arcidiacono V. and G.P. Cimellaro 2013. Damage Report with Smartphones during Emilia Earthquake. Paper presented at the *COMPADYN 4th ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake*, Kos Island, Greece

Arnstein, S.R. 1969. A Ladder of Citizen Participation. *JAIP* 35(4): 216-224.

Asian Development Bank 2015. *Proceedings of the Regional Knowledge Forum on Post-Disaster Recovery*. Philippines: Asian Development Bank. <https://www.adb.org/sites/default/files/publication/176471/proceedings-forum-post-disaster.pdf>

Associazione "Libera" 2014. *Terremoto Emilia-Romagna: Il lavoro dell'Osservatorio sulla Ricostruzione nella Legalità*. Blog post online since May 26, 2014. Available at: <http://www.libera.it/flex/cm/pages/serveblob.php/it/idpagina/9913terremoto%20emilia->

romagna:%20il%20lavoro%20dell'osservatorio%20sulla%20ricostruzione%20nella
%20legalità

Auf der Heide, E. 1989. *Disaster Response. Principles of Preparation and Coordination*. St. Louis: The C. V. Mosby Company.

Auger, G.A. 2013. Fostering democracy through social media: Evaluating diametrically opposed nonprofit advocacy organizations' use of Facebook, Twitter, and YouTube. *Public Relations Review* 39(4): 369-376

Austin, L., B. Fisher Liu and Y. Jin 2012. How Audiences Seek Out Crisis Information: Exploring the Social-Mediated Crisis Communication Model. *Journal of Applied Communication Research* 40(2): 188-207

Australian Red Cross 2010. *Communicating in Recovery*. Australian Red Cross online report. Retrieved on November 11, 2016. Available at:
www.redcross.org.au/communicatinginrecovery

Ball-Rokeach, S.J. 1985. The origins of individual media-system dependency: a sociological framework. *Communication research* 12(4): 485–51

Ball-Rokeach, S.J. and M.L. DeFleur 1976. A dependency model of mass-media effects. *Communication Research* 3:3-21

Ball-Rokeach, S.J., Y. Kim and S. Matei 2001. Storytelling neighborhood: paths to belonging in diverse urban environments. *Communication Research* 28(4): 392–428

Bannister, F and R. Connolly 2011. The Trouble with Transparency: A Critical Review of Openness in E-Government. *Policy & Internet* 3(1): 1-30

Barenstein, J.D. 2008. From Gujarat to Tamil Nadu: Owner-driven vs Contractor-driven Housing Reconstruction in India. Building resilience: achieving effective

post-disaster reconstruction. Paper presented at the *4th International Renewable Energy Congress*, 30- April – 2 May 2008, University of Canterbury, Christchurch, New Zealand

BBC Media Action 2015. *Humanitarian broadcasting in emergencies: a synthesis of evaluation findings*. BBC Media Action online report. Retrieved on 5 March, 2016. Available at:

<http://downloads.bbc.co.uk/mediaaction/pdf/research/humanitarian-broadcasting-in-emergencies-2015-report.pdf>

Bee, E., P. Coulon, J. Robbins and J. Tomlinson 2012. Hazard Map: Real Time Hazard Mapping Using Social Media. Paper presented at the *AGI Geocommunity 12: Sharing the Power of Place*, 18-20 September 2012, Nottingham, UK.

Beneito-Montagut, R., S. Anson, D. Shaw and C. Brewster 2013. Governmental Social Media use for Emergency Communication. In: T. Comes, F. Fiedrich, S. Fortier, J. Geldermann and L. Yang (eds) *Proceedings of the 10th International ISCRAM Conference* (pp. 828-833), Baden-Baden, Germany.

Bennett, W. L. and A. Segerberg 2011. Digital Media And The Personalization Of Collective Action. *Information, Communication & Society* 14(6): 770-799.

Benoit, W.L. 1997. Image Repair Discourse and Crisis Communication. *Public Relations Review* 23(2): 177–186

Berke, P. and D. Wenger 1991. *Montserrat: Emergency Planning, Response and Recovery Related to Hurricane Hugo*. Texas, USA: Hazard Reduction and Recovery Center, Texas A&M University

Berke, P. and T.J. Campanella 2006. Planning for Postdisaster Resiliency. *The ANNALS of the American Academy of Political and Social Science* 604(1): 192-207

Berke, P., J. Kartez and D. Wenger 1993. Recovery after disaster: Achieving sustainable development, mitigation, and equity. *Disasters* 17(2): 93–109

- Bertot, J. C., P.T. Jaeger and J.M. Grimes 2010. Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly* 27: 264-271
- Birkmann J, P. Buckle, J. Jaeger, M. Pelling, N. Setiadi, M. Garschagen, N. Fernando and J. Kropp 2010. Extreme events and disasters: a window of opportunity for change? Analysis of changes, formal and informal responses after mega-disasters. *Natural Hazards* 55(3): 637–655
- Blanchard-Boehm, R.D. 1998. Understanding Public Response to Increased Risk from Natural Hazards: Application of the Hazards Risk Communication. *International Journal of Mass Emergencies and Disasters* 16(3): 247-278
- Blumler J. G. and E. Katz 1974. *The Uses of Mass Communication*. Newbury Park, CA: Sage
- Bolin, R. and L. Stanford 1991. Shelter, Housing and Recovery: A Comparison of U.S. Disasters. *Disasters* 15(1): 24-34
- Bolin, R. and L. Stanford 1998. The Northridge Earthquake: Community-based Approaches to Unmet Recovery Needs. *Disasters* 22(1): 21-38
- Bonsòn, E., L. Torres, S. Royo and F.Flores 2012. Local e-government 2.0: Social media and corporate transparency in municipalities. *Government Information Quarterly* 29(2): 123-132
- Bouraoui, D. and G. Lizarralde 2013. Centralized decision-making, users' participation and satisfaction in post-disaster reconstruction: The case of Tunisia. *International Journal of Disaster Resilience in the Built Environment* 4(2): 145 – 167

- Bourk, M. and K. Holland 2014. From silos to flows: spatial metaphor and communication response to the Christchurch earthquakes. *Australian Journal of Emergency Management*. 29(2): 35-41
- Bourk, M., K. Holland and W. Blood 2015. 'Because we are in an emergency situation, we are unable to meet with you': A crisis of a crisis commons during the 2011 Christchurch Earthquake. *MEDIANZ* 15(2). DOI: 10.11157/medianz-vol15iss2id113
- Bowling, A. 2005. Mode of questionnaire administration can have serious effects on data quality. *Journal of Public Health* 27(3): 281-291.
- Braun, V. and V. Clarke 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77-101
- Briones, R., B. Kuch, B. Fisher Liu and Y. Jin 2011. Keeping up with the digital age: How the American Red Cross uses social media to build relationships. *Public Relations Review* 37(1): 37-43.
- Brody, S.D., D.R. Godschalk and R.J. Burby 2003. Mandating Citizen Participation in Plan Making: Six strategic planning choices. *Journal of the American Planning Association* 69(3): 245-264
- Brown C., M. Milke and E. Seville 2011. Disaster waste management: a review article. *Waste Management* 31:1085–1098
- Brownstein, J.S., C.C. Freifield and L.C. Madoff 2009. Digital disease detection - Harnessing the web for public health surveillance. *The New England Journal of Medicine* 360(21): 2153-5.
- BRR 2009. *10 Management Lessons for Host Governments Coordinating Post-disaster Reconstruction By the Executing Agency for Rehabilitation and Reconstruction (BRR) of Aceh–Nias 2005–2009*. Available at:

<http://www.recoveryplatform.org/assets/publication/BRR%2010%20Management%20Lessons%20for%20Host%20Governments.pdf>

Bruns, A. and J. Burgess 2012. Local and Global Responses to Disaster: #eqnz and the Christchurch Earthquake. Paper presented at *EARTH: FIRE AND RAIN Australian & New Zealand Disaster and Emergency Management Conference*, 16 – 18 April 2012, Brisbane, Australia.

Bruns, A. and S. Stieglitz 2012. Quantitative approaches to comparing communication patterns on Twitter. *Journal of Technology in Human Services* 30(3-4): 160-185.

Brusco S. 1982 The Emilian model: productive decentralisation and social integration *Cambridge Journal of Economics* 6: 167-184.

Bunce S., H.L. Partridge and K. Davis 2012. Exploring information experience using social media during the 2011 Queensland floods: a pilot study. *Australian Library Journal* 61(1): 34-45

Burger B., M. Gochfeld, C. Jeitner, T. Pittfield and M. Donio 2013. Trusted information sources used during and after Superstorm Sandy: TV and radio were used more often than Social Media. *Journal of Toxicology and Environmental Health* 76(20): 1138–1150

Burgess, J. and A. Bruns 2013. *Cumulative and comparative social media analytics for crisis communication*. Selected Papers of Internet Research 14.0, Denver, CO, USA: Association of Internet Researchers (Eds). Available at: http://eprints.qut.edu.au/67133/2/IR14_Burgess_%26_Bruns.pdf

Burke, J.A, P.R. Spence and K. Lachlan 2010. Crisis preparation, media use, and information seeking during Hurricane Ike: Lessons learned for emergency communication. *Journal of Emergency Management* 8(5): 27-37

Butler, J.K. and R.S. Cantrell 1984. A behavioral decision theory approach to modeling dyadic trust in superiors and subordinates. *Psychological Reports* 55:19-28.

Butt, S, and J.G. Phillips 2008. Personality and self reported mobile phone use. *Computers in Human Behavior* 24(2): 346–360

Cancern 2015. *The Space of Discomfort*. Newsletter #173. Blog post online since December 19, 2015. Available at: <http://cancern.org.nz/newsletter/newsletter-173/>

Cannon, T. 2008. *Reducing People's Vulnerability to Natural Hazards Communities and Resilience*. Research Paper No. 2008/34. Helsinki: UNU-Wider. Available at: <https://www.wider.unu.edu/publication/reducing-people%E2%80%99s-vulnerability-natural-hazards>

Canterbury CDEM group 2014. *Canterbury CDEM group plan*. CDEM group online report. Retrieved on May 20, 2016. Available at: <http://cdemcanterbury.govt.nz/media/34987/canterbury-cdem-group-plan-2014.pdf>

Canterbury Earthquake Recovery Authority (CERA) 2012. *Recovery Strategy for Greater Christchurch Mahere Haumanutanga o Waitaha*. Christchurch: Canterbury Earthquake Recovery Authority. CERA online report. Retrieved on December 14, 2015. Available at: <http://cera.govt.nz/sites/default/files/common/recovery-strategy-for-greater-christchurch.pdf>

Canterbury Earthquake Recovery Authority (CERA) 2014. *Canvas: your thinking for the red zones*. CERA online report. Retrieved on December 14, 2015. Available at: http://www.redzoneplan.nz/_data/assets/pdf_file/0016/8404/Summary-of-findings-for-the-Waimakariri-District-December2014-1.pdf

Carlton, S. 2013. Share an Idea, spare a thought: Community consultation in Christchurch's time-bound post-earthquake rebuild. *Journal of Human Rights in the Commonwealth* 1(2) DOI: <http://dx.doi.org/10.14296/jhrc.v1i2.1714>

Carlton, S. and S. Vallance 2013. *An Inventory of Community-led and Non-Governmental Organisations and Initiatives in Post-earthquake Canterbury (to September 2013)*. Online report. Retrieved June, 11, 2015 Available at: <http://www.lincoln.ac.nz/Documents/LEaP/Final%20Inventory.pdf>

Carter, L. and F. Belanger 2005. The utilization of e-government services: citizen trust, innovation and acceptance. *Information Systems Journal* 15: 5-25.

Cartlidge, E. 2014. Human Activity May Have Triggered Fatal Italian Earthquakes, Panel Says. *Science* 344(6180): 141.

CDAC Network 2014. *CDAC Network Typhoon Haiyan learning review case study: consolidating community feedback through CwC and AAP technical working groups in the Philippines*. CDAC online report. Retrieved on 4 July, 2016. Available at: <http://www.cdacnetwork.org/contentAsset/raw-data/7561706b-cf63-4754-8c2e-aa342de580c8/attachedFile>

Cernea M. 1997. The risks and reconstruction model for resettling dislocated people. *World Development* 25:1569-1587

Chandra, A. and J.D. Acosta 2010. Disaster Recovery Also Involves Human Recovery. *JAMA* 304(14): 1608-1609

Chang, S. E. 2000. Disasters and transport systems: loss, recovery and competition at the Port of Kobe after the 1995 earthquake. *Journal of Transport Geography* 8(1): 53-65

Chang, S. E., J.E. Taylor, K.J. Elwood, E. Seville, D. Brunson and M. Gartner 2014. Urban Disaster Recovery in Christchurch: The Central Business District Cordon and Other Critical Decisions. *Earthquake Spectra* 30(1): 513-532

Chang, S.E. 2010. "Urban Disaster Recovery: A Measurement Framework with Application to the 1995 Kobe Earthquake." *Disasters* 34(2): 303-327

Chang, Y., S. Wilkinson, R. Potangaroa and E. Seville 2012. Analysis of resource availability for post- earthquake reconstruction in Christchurch, New Zealand. Paper presented at the *8th annual International Conference of the International Institute for Infrastructure, Renewal and Reconstruction (IIIRR)*, 24- 26 August 2012. Kumamoto, Japan.

Chatfield, A. T. and M. Barrett 2011. Disaster communication governance and public trust: the case of TEPCO. Abstracts of the *2nd International Conference on Integrated Disaster Risk Management: Reframing Disasters and Reflecting on Risk Governance Deficits*, 14-16 July 2011, University of Southern California, Los Angeles, USA.

Chatfield, A. T. and U. Brajawidagda 2014. Crowdsourcing hazardous weather reports from citizens via Twittersphere under the short warning lead times of EF5 intensity tornado conditions. Paper presented at the *47th Hawaii International Conference on the System Sciences (HICSS)*, 6-9 January 2014, Hawaii, USA.

Chatfield, A. T., H.J. Scholl and U. Brajawidagda 2014. #Sandy tweets: Citizens' co-production of time-critical information during an unfolding catastrophe. Paper presented at the, *47th Hawaii International Conference on the System Sciences (HICSS)*, 6-9 January 2014, Hawaii, USA.

Chester, D. K., A. Duncan, R. Coutinho, N. Wallenstein, N., & S. Branca 2017. Communicating information on eruptions and their impacts from the earliest times until the late twentieth century. In D. Bird, C. Fearnley, K. Haynes, G. Jolly, & B. McGuire (Eds.), *Observing the Volcano World: Volcano Crisis Communication* (pp. 1-25). Berlin: Springer.

Cho, A. 2014. Post-tsunami recovery and reconstruction: governance issues and implications of the Great East Japan Earthquake. *Disasters* 38(s2): s157-s178

- Civil Defence Group Emergency Management (CDEM) Office 2014. *Canterbury Civil Defence Emergency Management Group PLAN*. CDEM online report. Retrieved on June 3, 2016.. Available at: <http://cdemcanterbury.govt.nz/media/34987/canterbury-cdem-group-plan-2014.pdf>
- Collins, S., B. Glavovic, S. Johal and D. Johnston 2011. Community engagement post-disaster: Case studies of the 2006 Matata debris flow and 2010 Darfield earthquake, New Zealand. *New Zealand Journal of Psychology* 40(4): 17.
- Committee on Disasters and the Mass Media 1980. *Disasters and the Mass Media*. Washington, D.C: Academy of Sciences
- Contreas, D. 2016. Fuzzy Boundaries Between Post-Disaster Phases: The Case of L'Aquila, Italy. *International Journal of Disaster Risk Science* 7: 277-292
- Coombs, W. T. 1999. *Ongoing crisis communication: planning, managing, and responding*. Thousand Oaks: Sage.
- Coombs, W.T 2010. Crisis Communication and Its Allied. In: W. T. Coombs and S. J. Holladay (Eds), *The Handbook of Crisis Communication*. Wiley & Sons, Ltd., Publication, Chichester, UK: 54-64
- Coombs, W.T. 2007. Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate Reputation Review* 10(3):163-176.
- Covello, V.T. 1992. Trust and Credibility in Risk Communication. *Health and Environmental Digest* 6(1): 1-3
- Crothers, C., A. Gibson, P. Smith, A. Bell and M. Miller 2014. *Internet Trends in New Zealand 2007–2013*. Institute of Culture, Discourse & Communication, Auckland University of Technology online report. Retrieved on June 4, 2016.

Available at: https://www.aut.ac.nz/_data/assets/pdf_file/0005/473576/ONLINE-WIPNZ2007_20137_7-0702a.pdf

D'Ambra, J., R.E. Rice and M. O'Connor 1998. Computer-mediated communication and media preference: An investigation of the dimensionality of perceived task equivocality and media richness. *Behaviour and Information Technology* 17(3): 164-174.

Dabner, N. 2012. Breaking Ground' in the use of social media: A case study of a university earthquake response to inform educational design with Facebook. *The Internet and Higher Education* 15(1): 69-78

Daft, R.L. and R.H. Lengel 1984. Information richness: a new approach to managerial behavior and organizational design. In: L.L. Cummings and B.M. Staw (Eds.), *Research in organizational behavior* 6. JAI Press, Homewood, IL: 191-233

Dahlhamer, J.M. and K. Tiemey 1996. *Rebounding from Disruptive Events: Business Recovery Following the Northridge Earthquake*. Preliminary paper no. 242. Newark, DE: Disaster Research Center, University of Delaware. Available at: <http://udspace.udel.edu/handle/19716/650>

Dalziel, P. and C. Saunders 2012. Regional Development Before And After An Earthquake: The Canterbury New Zealand Experience. *The Australasian Journal Of Regional Studies* 18(1): 100-127.

Dashti, S., L. Palen, M.P. Heris, M. Kenneth. K.M. Anderson, S. Anderson, T.J. Anderson 2014. Supporting Disaster Reconnaissance with Social Media Data: A Design-Oriented Case Study of the 2013 Colorado Floods'. Paper presented at the 11th International conference on Information Systems for Crisis Response and Management (ISCRAM), 18-21 May 2014, Pennsylvania, USA.

- Davidson, A.R., J.J. Jaccard, C. Harry, H.C. Triandis, M.L. Morales and R. Diaz-Guerrero 1976. Cross-Cultural Model Testing: Toward a Solution of the Etic-Emic Dilemma. *International Journal of Psychology* 11(1): 1-3
- Davidson, C.H., C.Johnson, G. Lizarralde, N. Dikmen and S. Sliwinski 2007. Truths and myths about community participation in post-disaster housing projects. *Habitat International* 31(1): 100-115
- Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13(3): 319-340
- Davis, I. 2007. *Learning from Disaster Recovery. Guidance for Decision Makers.* International Recovery Platform online report. Retrieved online on January 3, 2017. Available at: <http://www.recoveryplatform.org/assets/publication/learning-from-disaster-recovery.pdf>
- Davis, I. and D. Alexander 2016. *Recovery from Disaster*, Routledge Studies in Hazards, Disaster Risk and Climate Change. Abingdon: Routledge
- de Ville de Goyet, C. 2008. Information Gaps in Relief, Recovery, and Reconstruction in the Aftermath of Natural Disasters. In: S. Amin & M. Goldstein (Eds), *Data Against Natural Disasters Establishing Effective Systems for Relief, Recovery, and Reconstruction*, World Bank Group, Washington D.C: 23-58
- Della Porta, D. 2008. Comparative Analysis: Case-Oriented Versus Variable-Oriented Research, In: D. Della Porta & M. Keating (Eds), *Approaches and methodologies in the social sciences: a pluralist perspective*, Cambridge University Press, Cambridge (NY): 198-222
- DeLorme, D.E, G. M. Zinkhan and S.C. Hagen 2004. The Process of Consumer Reactions to Possession Threats and Losses in a Natural Disaster. *Marketing Letters* 15(4): 185-199

Demos & Pi 2013. *Focus: Ecco I Cives.net la Community Politica*. Demos & Pi online report. Retrieved on May 3, 2015. Available at:
http://www.demos.it/2013/pdf/2516capsoc36_civesnet.pdf

Department of Internal Affairs 2011. *Social media in Government*.
Department of Internal Affairs online report. Retrieved on December 15, 2016.
Available at: <https://webtoolkit.govt.nz/files/Social-Media-in-Government-High-level-Guidance-final.pdf>

di Maio, A 2011. *The Best Government Social Media Guidelines So Far Come from New Zealand*. Blog post online since December 1, 2011. Available at:
http://blogs.gartner.com/andrea_dimaio/2011/12/01/best-government-social-media-guidelines-so-far/ . 18 November 2016

Dimitrova, D. and Y.C. Chen 2006. Profiling the adopters of e-government information services: the influence of psychological characteristics, civic mindedness, and information channels. *Social Science Computer Review* 24(2): 172-188

Dimmick, J. and E.W Rothenbuhler 1984. Competitive displacement in the communication industry: New media in old environments. In R. Rice (Eds.), *The new media*. Sage, Beverly Hill: 287-304.

Dionisio, M. R., S. Kingham, K. Banwell and J. Neville 2015. The potential of geospatial tools for enhancing community engagement in the post-disaster reconstruction of Christchurch, New Zealand. *Procedia Engineering* 118: 356-370

Dunaetz, D.R, T.C. Lisk and M.M. Shin 2015. Personality, Gender, and Age as Predictors of Media Richness Preference. *Advances in Multimedia* 20. DOI [10.1155/2015/243980](https://doi.org/10.1155/2015/243980)

Dutta-Bergman, M.J. 2004. Complementarity in consumption of news types across traditional and new media. *Journal of Broadcasting & Electronic Media* 48(1): 41-60

Eisenhardt, K. M. 1989. Building theories from case study research. *Academy of Management Review* 14: 532–550

Eisenhardt, K. M. and M.E. Graebner 2007. Theory building from case studies: Opportunities and challenges. *Academy of Management Journal* 50(1): 25-32

Enarson, E. and B.H. Morrow 1998. *The Gendered Terrain of Disaster: Through Women's Eyes*, Westport, CT: Praeger Publishers

Erumban, A. and S. Jong 2006. Cross-country differences in ICT adoption: A consequence of Culture? *Journal of World Business* 41(4): 302–314

European Commission website (no date). *Italy – Disaster Management Structure*. Retrieved on March 3, 2016. Available at http://ec.europa.eu/echo/files/civil_protection/vademecum/it/2-it-1.html

Farberow, N. L. and N.S. Gordon 1981. *Manual for child health workers in major disasters* DHHS Publication No. ADM 81-1070. Rockville, MD: Center for Mental Health Services (CMHS). Available at: <http://cidbimena.desastres.hn/pdf/eng/doc1307/doc1307-1.pdf>

Farinosi, M. 2011. Civic Engagement and Community Empowerment After a Natural Disaster. The Case of “3e32” Citizens' Committee. Paper presented at the *CIRN Community Informatics Conference*, 9-11 November 2011, Prato, Italy.

Farinosi, M. and E. Treré 2010. Inside The "People of The Wheelbarrows": Participation Between Online and Offline Dimension in The Post-Quake Social Movement. *Journal of Community Informatics*, 6(3). Available at: <http://ci-journal.net/index.php/ciej/article/view/761>

Farinosi, M. and E. Trerè 2016. Challenging mainstream media, documenting real life and sharing with the community: An analysis of the motivations for producing

citizen journalism in a post-disaster city. *Global Media and Communication* 10:73-92

FEMA 2011. *National Recovery Framework*. FEMA online report. Retrieved on August 1, 2015. Available at: http://www.fema.gov/media-library-data/20130726-1820-25045-5325/508_ndrf.pdf

Fereday, J. and E. Muir-Cochrane 2006. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *The International Journal of Qualitative Methods* 5(1): 1-11

Fink, S. 1986. *Crisis management: Planning for the inevitable* New York, N.Y: American Management Association.

Firestone, W. A. 1993. Alternative Arguments for Generalizing from Data as Applied to Qualitative Research. *Educational Researcher* 22(4): 16-23.

Fishbein, M. and I. Ajzen 1975. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Reading, MA: Addison-Wesley.

Flynn, B. 1999. Disaster mental health: The U.S. experience and beyond. In: J. Leaning, S. Briggs, & L. Chen (Eds.), *Humanitarian crises: The medical and public health response*. Harvard University Press, Cambridge, MA: 97-123

Fothergill, A. and L.A Peek 2004. Poverty and Disasters in the United States: A Review of Recent Sociological Findings. *Natural Hazards* 32: 89–110,

Fothergill, A., E.G. Maestas and J.D. Darlington 1999. Race, Ethnicity, and Disaster in the United States: A Review of the Literature. *Disasters* 23(2): 156- 173

Franklin, K.L. 1996. *K.L. Pike on etic vs. emic: a review and interview*. Summer Institute of Linguistics. SIL International, Dallas, Texas.

- Frey, L., C. Botan and G. Kreps 1999. *Investigating communication: An introduction to research methods* (2nd ed.). Boston: Allyn & Bacon
- Fuchs, C. 2006. The Self-Organization of Social Movements. *Systemic Practice and Action Research* 19(1):101-137
- Gaillard J.C. and J.R.D. Cadag 2009. From marginality to further marginalization: Experiences from the victims of the July 2000 Payatas trashslide in the Philippines. *Jàmbá: Journal of Disaster Risk Studies* 2(3): 197-215
- Galea, S., A. Nandil and D.Vlahov 2005. The Epidemiology of Post-Traumatic Stress Disorder after Disasters. *Epidemiologic Reviews* 27:78–91
- Ganapati, N.E. 2012. In Good Company: Why Social Capital Matters for Women during Disaster Recovery. *Public Administration Review* 72(3): 419-427
- Ganapati, N.E. and S. Ganapati, S. 2009. Enabling participatory planning after disasters : A Case study of the world bank's Housing Reconstruction in turkey. *Journal of American association* 75(1): 41-59
- Garnett, J.D. and M. Moore 2010. Enhancing Disaster Recovery: Lessons from Exemplary International Disaster Management Practices. *Journal of Homeland Security and Emergency Management* 7(1): 1-20
- Gazzetta di Mantova 2015. *Bloccati gli indennizi. La Bassa del sisma trema. Gazzetta di Mantova*. Article published on 27 February 2015. Available at: <http://gazzettadimantova.gelocal.it/mantova/cronaca/2015/02/27/news/bloccati-gli-indennizi-la-bassa-del-sisma-trema-1.10947176>
- George, A. L. and A. Bennett 2005. The Method of Structured, Focused Comparison. In: A.L. George and A. Bennet (Eds), *Case Studies and Theory Development in the Social Sciences* MIT Press, Harvard: 67-73

GFDRR 2015. *Guide To Developing Disaster Recovery Frameworks Sendai Conference Version*. Available at:
<https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf>

GFDRR 2015. *Guide To Developing Disaster Recovery Frameworks*. Sendai Conference Version March 2015. GFDRR online report. Retrieved on March 24, 2016. Available at: <https://www.gfdr.org/sites/gfdr/files/publication/DRF-Guide.pdf>

Gibson, A., C. Crothers, P. Smith, A. Aguirre and A. Bell 2012. *Online engagement with government: Insights from the World Internet Project NZ*. Auckland, New Zealand: Institute of Culture, Discourse & Communication, AUT University. Retrieved on April 3, 2016. Available at:
https://www.aut.ac.nz/__data/assets/pdf_file/0020/320807/WIP-online-engage-government.pdf

Gibson, A., M. Miller, P. Smith, A. Bell and C. Crothers 2013. *The Internet in New Zealand 2013*. Auckland, New Zealand: Institute of Culture, Discourse & Communication, AUT University, Retrieved on April 3, 2016. Available at:
https://www.aut.ac.nz/__data/assets/pdf_file/0007/424816/wipnz2013final.pdf

Gilbert, C. 1998. Studying Disaster: Changes in the Main Conceptual Tools. In E.L. Quarantelli (Eds), *What is a Disaster? Perspectives on the Question*, Routledge, London and New York: 11-18

Gilbert, D., P. Balestrini and D. Littleboy 2004. Barriers and benefits in the adoption of E-government. *The International Journal of Public Sector Management* 17(4): 286-301.

Giliberto, J. 2014. Terremoto in Emilia ed estrazioni petrolifere, cosa dice il rapporto Ichese. *Il Sole 24 Ore*. Article published online on May 10, 2014. Available at: <http://www.ilsole24ore.com/art/notizie/2014-05-10/terremoto-emilia-ed-estrazioni-petrolifere-cosa-dice-rapporto-ichese-111118.shtml>

- Giovinazzi, S., J.R Stevenson, H Kachali, Z. Whitman, E. Seville, J. Vargo, T.M. Wilson 2011. *Lifelines Performance and Management following the 22 February 2011 Christchurch Earthquake*, New Zealand: Highlights of Resilience. Online report. Available at: <http://hdl.handle.net/10092/6358>
- Giroux, J., F. Roth and M. Herzog 2013. *Using ICT & Social Media in Disasters: Opportunities & Risks for Government*. Center for Security Studies (CSS) *online report*. Retrieved on March 16, 2016. Available at: <http://www.preventionweb.net/publications/view/34376>
- Goldstein, B.E 2008. Skunkworks in the Embers of the Cedar Fire: Enhancing Resilience in the Aftermath of Disaster. *Human Ecology* 36(1): 15-28
- Gouldthorpe J.L. and G.D. Israel 2014. *The Savvy Survey #6c: Constructing Closed-Ended Items for a Questionnaire*. The Savvy Survey series, University of Florida, US. Available at: <https://edis.ifas.ufl.edu/pdf/EDIS/PD/PD06800.pdf>
- Government of Australia 2014. *Communication and Complex Emergencies: A Resource Guide*. Government of Australia online report. Retrieved on March 3, 2015. Available at: <http://reliefweb.int/report/world/communication-and-complex-emergencies-resource-guide>
- Greenberg, J. and J.T. Scanlon 2016. Old Media, New Media, and the Complex Story of Disasters. In: S.L Cutter (Eds), *Oxford Research Encyclopedia of Natural Hazard Science*. DOI: 10.1093/acrefore/9780199389407.013.21
- Griffin, R. J., K. Neuwirth, S. Dunwoody and J. Giese 2004. Information sufficiency and risk communication. *Media Psychology* 6(1): 23-61.
- Grimmelikhuijsen, S.G. 2010. Transparency of Public Decision-Making: Towards Trust in Local Government? *Policy & Internet* 2(1): 5-35

- Grimmelikhuijsen, S.G. 2012. *Transparency and trust. An experimental study of online disclosure and trust in Government*. Dissertation published by Utrecht University Repository. Available at:
<https://dspace.library.uu.nl/handle/1874/218113>
- Guba, E.G. and Y.S. Lincoln 1982. Epistemological and methodological bases of naturalistic inquiry. *ECTJ* 30(4): 233-252
- Gultom, D.I. 2016. Community-based disaster communication: how does it become trustworthy? *Disaster Prevention and Management* 25(4): 478 – 491
- GWI (GlobalWebIndex) 2012. *Social Platforms - The Global Report 2012- In Focus: Italy*. Retrieved on March 13, 2016. Available at:
<http://www.slideshare.net/globalwebindex/social-platforms-the-global-report-september-2012-italian-version>
- Hajek, A. 2013. Learning from L'Aquila: grassroots mobilization in post-earthquake Emilia-Romagna. *Journal of Modern Italian Studies* 18(5): 627-643
- Hall, E.T. 1976. *Beyond Culture*, New York, NY: Anchor Books.
- Hallegatte, S. and P. Dumas 2009. Can natural disasters have positive consequences? Investigating the role of embodied technical change. *Ecological Economics*, 68(3): 777-786
- Han, Z., X. Hu, and J. Nigg 2011. How does disaster relief works affect the trust in local government? A study of the Wenchuan earthquake. *Risk, Hazards & Crisis in Public Policy* 2(4): 1-20
- Hand, L. C. and B.D. Ching 2011. "You have one friend request": An exploration of power and citizen engagement in local governments' use of social media. *Administrative Theory & Praxis* 33:362–382

- Hannigan, J. 1976. *Newspaper Conflict and Cooperation Content After Disaster: An Exploratory Analysis*. Preliminary Paper 27. Newark, Delaware: Disaster Research Center. Available online at <http://udspace.udel.edu/handle/19716/384>
- Hastie, R. 1997. *Disabled Children in a society at war: A casebook from Bosnia*. Oxfam, Oxford, UK
- Hayashi, H. 2007. Long-term Recovery from Recent Disasters in Japan and the United States. *Journal of Disaster Research* 2(6): 413-418.
- Hayles, C. 2010. An examination of decision making in post disaster housing reconstruction, *International Journal of Disaster Resilience in the Built Environment* 1(1): 103 – 122
- Heider, F. 1958. *The Psychology of Interpersonal Relations*. New York: Wiley
- Heylighen, F. 2013. Self-organization in Communicating Groups: The Emergence of Coordination, Shared References and Collective Intelligence. In A. Massip-Bonet & À Bastardas-Boada (eds), *Complexity Perspectives on Language, Communication and Society*, Berlin, Germany, Springer: 117–149
- HHI (Harvard Humanitarian Initiative) 2011. *Disaster Relief 2.0: The Future of Information Sharing in Humanitarian Emergencies*. Washington, DC, USA and Berkshire, UK: UN Foundation & Vodafone Foundation Technology Partnership
- Hill, M. and J.C. Gaillard 2013. Integrating disaster risk reduction into post-disaster reconstruction: A long-term perspective of the 1931 earthquake in Napier, New Zealand. *New Zealand Geographer* 69(2): 108-119
- Hiltz, S.R. and J.J. Gonzalez 2012. Assessing and Improving the Trustworthiness of Social Media for Emergency Management: A Literature Review, in: V.A. Oleshchuk (Eds.) *Proceedings of Norwegian Information Security Conference*, Trondheim, Norway: 135-145.

- Hiltz, S.R. and L. Plotnick 2013. Dealing with Information Overload When Using Social Media for Emergency Management: Emerging Solutions. Paper presented at the *ISCRAM conference 2013 Conference, 12-15 May 2013, Baden- Baden, Germany*.
- Hiltz, S.R., J. Kushma and L. Plotnick 2014. Use of Social Media by U.S. Public Sector Emergency Managers: Barriers and Wish Lists. In: S.R. Hiltz, M.S. Pfaff, L. Plotnick & P. Shih (Eds), *Proceedings of the ISCRAM 2014 Conference*, Pennsylvania, USA, The Pennsylvania State University: 602-611
- Hofstede, G. 1980. *Culture's consequences* (1st ed.). Beverly Hills: SAGE.
- Hogg, S.J. 1980 Reconstruction Following Seismic Disaster In Venzone, Friuli. *Disasters* 4(2): 173–185
- Holt, K., A. Shehata, J. Strömbäck and E. Ljungberg 2013. Age and the effects of news media attention and social media use on political interest and participation: Do social media function as leveller? *European Journal of Communication* 28(1): 19–34
- Hughes, A., L. Palen, J. Sutton, S. Liu and S. Vieweg 2008. "Site-Seeing" in Disaster: An Examination of On-Line Social Convergence. In: F. Fiedrich & B. Van de Walle (Eds) *Proceedings of the Information Systems for Crisis Response and Management Conference (ISCRAM 2008)*, Washington D.C., USA: 324-333
- Hy, L., D.O Case, M.L. Lustria, N. Kwon, J.E. Andrews, S.E. Cavendish and B.R. Floyd 2007. Predictors of online information seeking by international students when disaster strikes their countries. *Cyberpsychology Behaviour* 10(5): 709-12.
- IFRC 2005. *World Disasters Report 2005–Data or dialogue? The role of information in disasters*. IFRC online report. Retrieved on January 2, 2016. Available at: <http://www.ifrc.org/en/publications-and-reports/world-disasters-report/wdr2005/#sthash.I93CKd8b.dpuf>

Il Fatto Quotidiano 2015. Terremoto Emilia, tre anni dopo ancora 1300 persone vivono nei container. *Il Fatto Quotidiano newspaper*. Article published online on 20 May 2015. Available at: <http://www.ilfattoquotidiano.it/2015/05/20/terremoto-emilia-tre-anni-dopo-ancora-1300-persone-vivono-nei-container/1701300/>

Il Messaggero 2012. Terremoto in Emilia, couchsurfing.com ora serve a trovare un tetto agli sfollati. *Il Messaggero newspaper*. Article published online on 5th June 2012. Available at http://www.ilmessaggero.it/primopiano/cronaca/terremoto_in_emilia_couchsurfingcom_ora_serve_a_trovare_un_tetto_agli_sfollati/notizie/199403.shtml

Ingram, J.C., G. Franco, C. Rumbaitis del Rio and B. Khazai 2006. Post-disaster recovery dilemmas: challenges in balancing short-term and long-term needs for vulnerability reduction. *Environmental Science and Policy* 9: 607-619.

Internews 2014. Understanding the Information and Communication Needs among IDPs in Northern Iraq. Inter- agency rapid assessment report. Retrieved on 4 June, 2016, Available at: https://www.internews.org/sites/default/files/resources/Iraq_IA_CwC_Report_2014-08_web.pdf

Internews 2015. *Communicating with Communities. Nepal Earthquake Response*. Internews online report. Retrieved on 4 June, 2016. Available at: https://www.internews.org/sites/default/files/resources/NepalAssessment_CwC_Chautara_May2015.pdf

IOM (International Organization for Migration) 2014. *Starting the Conversation: Information, Feedback and Accountability in Post-Typhoon Philippines.*, International Organization for Migration online report. Retrieved on May 2, 2016. Available at: <http://www.cdacnetwork.org/contentAsset/raw-data/3930b1cb-c03a-4a37-8e2f-39e20bc810d7/attachedFile>

Ismail. D., T.A. Majid, R. Roosli and H.N. ab Samah 2014. A review on post-disaster reconstruction project: issues and challenges faced by international non-governmental organisations (INGOs). Paper presented at the *International Post-Graduate Seminar (IPGS 2014), "Engineering Challenges Towards Better Life and Humanity"*, Shah Alam, Malaysia

ISTAT 2012. *Cittadini e Nuove Tecnologie*. Istat online report. Retrieved on December 3, 2015. Available at: <http://www.istat.it/it/archivio/78166>

Jayasuriya, S. And P. Mccawley. 2010. *The Asian Tsunami Aid And Reconstruction After A Disaster*. Asian Development Bank Institute And Edward Elgar Publishing UK, Northampton, MA, USA

Jiang, J. and N. Ouyang. 2008 New Media Use During the 5/12 Sichuan Earthquake. *Media Asia* 35(3):148-151

Joffe, H. 2012. Thematic Analysis. In: *Qualitative Research Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners*. Edited by David Harper and Andrew Thompson, Chichester: Wiley-Blackwell, pp. 209-223.

Johnson, B.B and P. Slovic 1994. "Improving" Risk Communication and Risk Management: Legislated Solutions or Legislated Disasters? *Risk Analysis* 14(6): 905-906

Johnson, C., G. Lizarralde and C.H., Davidson 2006. A systems view of temporary housing projects in post-disaster reconstruction. *Construction Management and Economics* 24(4): 367-378

Johnson, L. 2014. Developing a Local Recovery Management Framework: Report on the Post-Disaster Strategies and Approaches Taken by Three Local Governments in the U.S. Following Major Disasters. *International Journal of Mass Emergencies & Disasters* 32(2): 242-274.

Johnson, L. A. and R.B. Olshansky 2013. The Road to Recovery: Governing Post-Disaster Reconstruction. *Land Lines*. Available at:
http://www.lincolninst.edu/sites/default/files/pubfiles/2259_1598_The_Road_to_Recovery_0713LL.pdf

Johnson, L. and L. Mamula-Seadon 2014. Transforming Governance: How National Policies and Organizations for Managing Disaster Recovery Evolved Following the 4 September 2010 and 22 February 2011 Canterbury Earthquakes. *Earthquake Spectra* 30(1): 577-605.

Johnston, D., S. Standring, K. Ronan, M.Lindell, T.Wilson, J. Cousins, E. Aldridge , M. Warne Ardagh, J. M. Deely, S.Jensen, T. Kirsch and R. Bissell 2014. The 2010/2011 Canterbury earthquakes: context and cause of injury. *Natural Hazards* 73(2): 627-637

Jordan, E. and A. Javernick-Will 2013. Indicators of Community Recovery: A Content Analysis and Delphi Approach. *Natural Hazards Review* 14(1): 21-28.

Juris, J. S. 2005. The New Digital Media and Activist Networking within Anti-Corporate Globalization Movements. *The ANNALS of the American Academy of Political and Social Science* 597(1): 189-208.

Kaarbo, J. and R.K. Beasley 1999. A practical guide to the comparative case study method in political psychology. *Political Psychology* 20(2): 369-391

Kachali H., J. Stevenson, Z. Whitman, T. Hatton, E. Seville, J. Vargo and T. Wilson 2012. Organisational Resilience and Recovery for Canterbury Organisations after the 4 September 2010 Earthquake. *Australasian Journal of Disaster and Trauma Studies* 1:11-19

Kartez, J. and M. Lindell 1987. Planning for Uncertainty: The Case of Local Disaster Planning. *American Planning Association Journal* 53:487-498.

- Kates, R. W. and D. Pijawka 1977. From rubble to monument: the pace of reconstruction. In J. E. Haas, R. W Kates & M. J Bowden (eds.), *Reconstruction Following Disaster*, MIT Press, Cambridge, MA: 1-23
- Kavanaugh, A.L., E.A. Fox, S.D Sheetz, S. Yang, L. Tzy Li, D.J. Shoemaker, A. Natsev and L. Xie 2012. Social media use by government: From the routine to the critical. *Government Information Quarterly* 29: 480–491.
- Keeney, R.L. and D. von Winterfeldt 1986. Improving Risk Communication. *Risk Analysis*, 6(4): 417-424
- Kelman, I. 2005. Operational Ethics for Disaster Research. *International Journal of Mass Emergencies and Disasters* 23(3): 141-158.
- Kennedy, J., J. Ashmore, E. Babister, I. Kelman and J. Zarins 2009. Disaster Mitigation Lessons from 'Build Back Better' following the 26 December 2004 Tsunamis. In: J. Feyen, K. Shannon & M. Neville (eds.), *Water and Urban Development Paradigms: Towards an integration of engineering, design and management approaches*, Proceedings of the International Urban Water Conference, Heverlee, Belgium, 15-19 September 2008, Taylor and Francis, London, U.K.: 297-302
- Kenney, C. and S. Phibbs 2014. Shakes, rattles and roll outs: The untold story of Māori engagement with community recovery, social resilience and urban sustainability in Christchurch, New Zealand. *Procedia Economics and Finance* 18: 754-762
- Khodyakov, D. 2007. Trust as a Process: A Three-Dimensional Approach. *Sociology* 41(1): 115-132

Killick, D. 2014. Christchurch's SCIRT offers a model for rebuilding after a disaster. *Citiscopes*. Article published online on 7 August 2014. Available at: <http://citiscopes.org/story/2014/christchurchs-scirt-offers-model-rebuilding-after-disaster>

Kilpatrick, D. G. 2004. The Ethics of Disaster Research: A Special Section. *Journal of Traumatic Stress* 17(5): 361-362

Kovacs, P. and S. Gordelier 2009. Nuclear power and the public. *NEA News* 27(1): 4 –7.

Kreps, G. 1980. Research Needs and Policy Issues on Mass Media Disaster Reporting. In Committee on Disasters and the Mass Media (Eds), *Disasters and the Mass Media*. National Academy of Sciences, Washington, DC: 35-75

Kriegbaum, H. 1979. Three Mile Island coverage: A crash course for readers. *Mass. Communication Review* 6: 2-10.

Kweit, M. G. and R.W. Kweit 2004. Citizen Participation and Citizen Evaluation in Disaster Recovery. *American Review of Public Administration* 34:354-373

La Repubblica 2015. Processo Aemilia, la Regione si costituirà parte civile. *La Repubblica*. Article published online on 8 June 2015. Available at: http://bologna.repubblica.it/cronaca/2015/06/08/news/inchiesta_aemilia_la_regione_si_costituira_parte_civile-116390993/?ref=search

Lachlan, K. A. and P.R. Spence 2011. Crisis communication and the underserved: The case for partnering with institutions of faith. *Journal of Applied Communication Research* 39:448-451.

Lachlan, K.A., P.R. Spence, X. Lin, K. Najarian and M. del Greco 2016. Social Media and Crisis Management: CERC, Search Strategies, and Twitter Content. *Computers in Human Behavior* 54: 647–652

- Laituri, M. and K. Kodrich 2008. On Line Disaster Response Community: People as Sensors of High Magnitude Disaster Using Internet GIS. *Sensors* 8:3037-3055
- Lanzara G.F. 1983. Ephemeral Organizations In Extreme Environments: Emergence, Strategy, Extinction. *Journal of Management Studies* 20(1): 71–95
- Lasswell, H. 1948. The Structure and Function of Communication in Society. Bryson, L., (eds), *The Communication of Ideas*. Institute for Religious and Social Studies, New York: 215-228.
- Latonero, M. and I. Shklovski 2011. Emergency Management, Twitter, And Social Media Evangelism. *International Journal of Information Systems for Crisis Response and Management* 3 (4): 1–16
- Law, T. 2015. New rebuild bill gives Govt 'inappropriate' powers, council says. *Stuff*. Article published online on December 2, 2015. Available at: <http://www.stuff.co.nz/the-press/news/74614527/new-rebuild-bill-gives-govt-inappropriate-powers-council-says>
- Le Masurier, J., J.O.B. Rotimi and S. Wilkinson 2006. Comparison between routine construction and post-disaster reconstruction with case studies from New Zealand. Paper presented at the *22nd Annual ARCOM Conference*, 4-6 September 2006, Birmingham, UK.
- Lea, M. and R. Spears 1991. Computer-mediated communication, de-individuation and group decision-making. *International Journal of Man-Machine Studies* 39: 283-301
- Lee, G. and Y.H. Kwak 2012. An Open Government Maturity Model for social media-based public engagement. *Government Information Quarterly* 29(4): 492-503
- Leidner, D. and T. Kayworth 2006. A Review of Culture in Information Systems

- Research: Toward A Theory of Information Technology Culture Conflict. *MIS Quarterly* 30(2): 357-399.
- Lev-On, A. 2010. Engaging the Disengaged: Collective Action, Media Uses and Sense of (Virtual) Community by Evacuees from Gush Katif. *American Behavior Scientist* 53(8): 1208-1227
- Lewis, J. and Ritchie, J. 2003. Generalising from qualitative research. In J. Ritchie & J. Lewis (Eds). *Qualitative research practice – a guide for social science students and researchers*, Sage Publications, London: 263-286
- Liang, Y, J. Caverlee and J. Mander 2013. Text vs. images: on the viability of social media to assess earthquake damage. In: D. Schwabe, V. Almeida & H. Glaser (Eds), *Proceedings of the 22nd International Conference On World Wide Web companion*, ACM, New York, NY, USA: 1003-1006
- Liang, Y. 2016. Trust in Chinese Government and Quality of Life (QOL) of Sichuan Earthquake Survivors: Does Trust in Government Help to Promote QOL?. *Social Indicators Research* 127(2): 541-564
- Liel, A.B, R.B. Corotis, G. Camata, J.Sutton, R.Holtzman and E.Spacone 2013. Perceptions of Decision-Making Roles and Priorities Affecting Rebuilding After Disaster: the Example of L'Aquila, Italy. *Earthquake Spectra* 29(3): 843-68
- Lim, M. 2012. Clicks, Cabs, Coffee Houses: Social Media and the Oppositional Movements in Egypt (2004-2011). *Journal of Communication* 62: 231-24.
- Lincoln, Y. S. and E.G. Guba 2000. Paradigmatic controversies, contradictions, and emerging confluences. In: N. K. Denzin & Y. S. Lincoln (Eds.), *The handbook of qualitative research* (second edition), Sage, London: 163-188
- Lincoln, Y.S. and E.G. Guba 1985. *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications.

- Lindell, M. K. 2013. Recovery and Reconstruction After Disaster. In: P.T. Bobrowsky (Eds.) *Encyclopedia of Natural Hazards*, Springer, Dordrecht, New York: 812-824.
- Liu, B. F., J.D. Fraustino and Y. Jin 2014. How Disaster Information Form, Source, Type, and Prior Disaster Exposure Affect Public Outcomes: Jumping on the Social Media Bandwagon. *Journal of Applied Communication Research* 43(1): 44-65
- Lizarralde, G. and M. Massyn 2008. Unexpected negative outcomes of community participation in low-cost housing projects in South Africa. *Habitat international* 32(1): 1-14
- Lloyd-Jones, T. 2006. *Mind the Gap! Post-disaster reconstruction and the transition from humanitarian relief*. London: Royal Institution of Chartered Surveyors (IRCS).
- Lobb A., N. Mock and P.L. Hutchinson 2012. Traditional and social media coverage and charitable giving following the 2010 earthquake in Haiti. *Prehospital Disaster Medicine* 27(4): 319-324.
- Longstaff, P. H. and S. Yang 2008. Communication management and trust: their role in building resilience to “surprises” such as natural disasters, pandemic flu, and terrorism. *Ecology and Society* 13(1): 3.
- Loosemore, M. 1999. A grounded theory of construction crisis management, *Construction Management and Economics* 17(1): 9-19
- Lor, P. 2011. Methodology in comparative studies. In: Lor, P (Ed.) *International and Comparative Librarianship*. Available at: <http://peterlor.com/the-book/>
- Low, R., M. Burdon, S. Christensen, W. Duncan, P. Barnes and E. Foo 2010. Protecting the protectors: Legal liabilities from the use of Web 2.0 for Australian disaster response. Paper presented at the 2010 IEEE international symposium on technology and society, IEEE, 7-9 June, Wollongong, Australia

Lowrey, W. 2004. Media Dependency During a Large-Scale Social Disruption: The Case of September 11. *Mass Communication and Society* 7(3): 339-357

Lyons, M. 2009. Building Back Better: The Large-Scale Impact of Small-Scale Approaches to Reconstruction. *World Development* 37(2): 385-398

Madianou, M. 2015. Digital Inequality and Second-Order Disasters: Social Media in the Typhoon Haiyan Recovery. *Social Media + Society* 1(2), DOI [10.1177/2056305115603386](https://doi.org/10.1177/2056305115603386)

Madianou, M. and D. Miller 2013. Polymedia: Towards a new theory of digital media in interpersonal communication. *International Journal of Cultural Studies* 16(2): 169–187

Manoi, B.S. and A. Baker 2007. Communication challenges in emergency response. *Communications of the ACM - Emergency response information systems: emerging trends and technologies* 50(3): 51-53

Manyena, S. B., G. O'Brien, P. O'Keefe and J. Rose 2011. Disaster resilience: a bounce back or bounce forward ability? *Local Environment* 16: 417–424

Mayring, P. 2007. On Generalization in Qualitatively Oriented Research [23 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* 8(3). Available at: <http://nbn-resolving.de/urn:nbn:de:0114-fqs0703262>.

McLennan, E.J. 2016. Mental health services at 'breakingpoint'. *NZ Herald*. Article published online on June 2, 2016. Available at: http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11649597M.

McLuhan, M., Q. Fiore and J. Agel 1967. *The medium is the message: An inventory of effects*. New York, NY: Bantam Books

McNaughton, E., J. Wills and D. Lallemand 2015. Leading in Disaster Recovery - A Companion through the Chaos. Book on disaster recovery leadership. Red Cross

Global Disaster Preparedness Center. DOI: 10.13140/2.1.4764.3689 Available at: http://preparecenter.org/sites/default/files/leading_in_disaster_recovery_a_companion_through_the_chaos.pdf

McNie, E.C. 2013. Delivering Climate Services: Organizational Strategies and Approaches for Producing Useful Climate-Science Information. *Weather, Climate & Society* 5(1): 14-26

Mead Niblo D. and M.S. Jackson 2004. Model for combining the qualitative emic approach with the quantitative derived etic approach. *Australian Psychologist* 39(2): 127-133

Meaton, D.J. and L.A Stringer 2013. The Use Of Social Media By UK Local Resilience Forums. *Emergency Management Review* 2(1): 7-21

Meier, C. 2015. Ex-Mayor Garry Moore Leads Group Calling For Council-Led Recovery. *Stuff*. Article published on July 24, 2015. Available at: <Http://Www.Stuff.Co.Nz/The-Press/Business/The-Rebuild/70509847/Exmayor-Garry-Moore-Leads-Group-Calling-For-Councilled-Recovery.Html>

Meier, P. 2014. *The Filipino Government's Official Strategy on Crisis Hashtags*. Blog post online since July 1, 2014. Retrieved on March 18, 2016. Available at: <https://irevolutions.org/2014/07/01/filipino-official-strategy-crisis-hashtags/>

Mendoza, M. B. Poblete and C. Castillo 2010. Twitter Under Crisis: Can We Trust What We RT? In Proc. of 1st Workshop on Social Media Analytics, NY, ACM: 71-79

Mergel, I 2013b. A framework for interpreting social media interactions in the public sector. *Government Information Quarterly* 30(4): 327-334

Mergel, I. 2013a. Social media adoption and resulting tactics in the U.S. federal government, *Government Information Quarterly* 30(2): 123-130

- Mergel, I. 2015. Designing Social Media Strategies and Policies. In: J. L. Perry & R. K. Christensen (Eds), *Handbook of Public Administration*, Jossey-Bass Wiley: 456-468
- Mergel, I. and S.L. Bretschneider 2013. A Three-Stage Adoption Process for Social Media Use in Government. *Public Administration Review* 73(3): 390-400.
- Mileti, D. S. and J.H.Sorensen 1990. *Communication of emergency public warnings: A social science perspective and state-of-the-art assessment*. Paper prepared for the Federal Emergency Management Agency, Washington D.C. Oak Ridge, Tennessee: Oak Ridge National Laboratory.. Available at: <https://searchworks.stanford.edu/view/11286534>
- Mileti, D.S. 1999. *Disasters By Design: A Reassessment of Natural Hazards in the United States*, Washington, D.C: Joseph Henry Press.
- Mileti, D.S. and P.W. O'Brien 1992. Warnings during Disaster: Normalizing Communicated Risk. *Social Problems* 39(1): 40-57
- Mill, J.S. 1843. *A System of Logic, Ratiocinative and Inductive Part I in The Collected Works of John Stuart Mill*, Volume VII -(seventh edition, 1868), London: Longmans, Green, Reader, and Dyer.
- Ministero dell'Interno 2012. *Decreto Istitutivo Girer*. Ministero dell'Interno online document. Retrieved on Jun3 3, 2015. Available at <http://www.regione.emilia-romagna.it/terremoto/gli-atti-per-la-ricostruzione/provvedimenti-nazionali>
- Mishra, A. 1996. Organizational Responses to Crisis: The Centrality of Trust. In R.M. Kramer, & T.R. Tyler (Eds). *Trust in Organizations: Frontiers of Theory and Research*, Sage, Thousand Oaks, CA: 261-287.
- Mitroff, I.I. 1994. Crisis management and environmentalism: A natural fit. *California Management Review* 36(2): 101-113

- Moon, M. J. and D. Norris 2005. Does managerial orientation matter? The adoption of reinventing government and e-government at the municipal level. *Information Systems Journal* 15: 43-60.
- Moretti, M., L. Abbruzzese, P. Augliera, R. Azzara.....G. Vannucci and L. Zaccarelli 2013. Emergency Structure Activities Performed after Emilia Romagna earthquake: report of first month. *Quaderni di Geofisica* 110:2-40
- Mosca, L. 2012. Le campagne elettorali online fra innovazione e manipolazione. *Parolechiave* 47:95-110
- Mythen, G. 2010. Reframing risk? Citizen journalism and the transformation of news. *Journal of Risk Research* 13(1): 45-58
- Nakagawa, Y. and R. Shaw 2004. Social Capital: A Missing Link to Disaster Recovery. *International Journal of Mass Emergencies and Disasters* 22(1): 5-34.
- New Zealand Parliament, 2011. Canterbury Earthquake Recovery Act 2011. New Zealand Parliament online document. Retrieved on May 2, 2016. Available at <http://www.legislation.govt.nz/act/public/2011/0012/latest/DLM3653522.html>.
- Nicholls, K. and S.J. Picou 2013. The Impact of Hurricane Katrina on Trust in Government. *Social Science Quarterly* 94(2): 344-361
- Nicholls, S. 2012. The resilient community and communication practice. *Australian Journal of Emergency Management* 27(1): 46-51
- Nicholls, S., J. Sykes and P. Camilleri 2010. The role of the media and communication in recovery from natural disasters: A case study of the Canberra 'firestorm' and its aftermath 2003-2007. *Australian Journal of Communication* 37(5): 33-50.
- Nigg, J. and K. Tierney 1993. *Disaster and Social Change: Consequences for Community Construct and Affect*. Preliminary Paper #195. Newark, DE: University of Delaware, Disaster Research Center. Available at <http://udspace.udel.edu/handle/19716/580>

- Nigg, J.M. 1982. Communication under conditions of uncertainty: Understanding Earthquake Forecasting. *Journal of Communication* 32(1): 27-36.
- Nigg, J.M. 1995. *Disaster Recovery as a Social Process*. Preliminary Paper #219, University of Delaware, Disaster Research Center. Available at <http://udspace.udel.edu/bitstream/handle/19716/625/PP219.pdf?>
- Norris, F., M. Friedman, S. Galea and P. Watson 2006. *Methods for Disaster Mental Health Research*. New York, NY: Guilford Press.
- Noske-Turner, J., J. Tacchi and E. Papoutsaki 2014. Locating disaster communication in changing communicative ecologies across the Pacific. *AJTDE* 2(4): 1-16
- Oliveira, G.H.M. and E.W. Welch 2013. Social media use in local government: Linkage of technology, task, and organizational context. *Government Information Quarterly* 30(4): 397– 405
- Oliver-Smith, A. 1990. Post-disaster housing reconstruction and social inequality: a challenge to policy and practice. *Disasters* 14(1): 7-19.
- Oliver-Smith, A. 1991. Successes and failures in post-disaster resettlement. *Disasters* 15(1): 12-23
- Olshansky, R. B. 2005. How do Communities Recover from Disaster? A Review of Current Knowledge and an Agenda for Future. Presented at *46th Annual Conference of the Association of Collegiate Schools of Planning Kansas City*, October 27, 2005, Kansas City, Missouri.
- Olshansky, R. B., L.A. Johnson and K.C. Topping 2006. Rebuilding Communities Following Disaster: Lessons from Kobe and Los Angeles. *Built Environment* 32(4): 354-374

Olshansky, R.B, L.D. Hopkins and L.A. Johnson 2012. Disaster and recovery: Processes compressed in time. *Natural Hazard Review* 13(3): 173-178

Oosters, B. 2005. *Looking with a disability lens at the disaster caused by the Tsunami in South-East Asia*. CBM International: Brussels

Opdyke, A., A. Javernick-Will, M. Koschmann, H. Moench 2016. A Constitutive Communication Lens of Stakeholder Participation in Post-Disaster Construction. Paper presented at the *Engineering Project Organization Conference*, June 28-30, 2016. Cle Elum, Washington, USA.

OPERA (Unità di Ricerca del Centro di Ricerca GIUnO) 2011. *Utilizzo dei social network nei comuni italiani di medie e grandi dimensioni*. OPERA online Report. Retrieved on January 10, 2014. Available at: http://www.qualitapa.gov.it/fileadmin/dam/customer_online/report%20comuni%202011.pdf

Ophiyandri, T, R.D.G. Amaratunga and C.P. Pathirage 2010. *Community based post disaster housing reconstruction: Indonesian perspective*, University of Salford paper. Salford, UK Available at: <http://usir.salford.ac.uk/9761/1/536.pdf>

Orense, R. P., T. Kiyota, S. Yamada, M. Cubrinovski, Y. Hosono, M. Okamura and S. Yasuda 2011. Comparison of liquefaction Features observed during the 2010 and 2011 Canterbury earthquakes. *Seismological Research Letters* 82(6): 905-918

Oulahen, G. and B. Doberstein 2010. *Citizen participation in flood reduction planning: Strategic choices in Peterborough*. Ontario ICLR Research Paper Series – Number 47. Toronto, Ontario: Institute for Catastrophic Loss Reduction. Available at: https://www.iclr.org/images/Oulahen_Doberstein_2010_ICLR_47.pdf

Ozden, A.T. 2006. Developing a model for community involvement in post-disaster housing programmes. *Paper presented at the 3rd International i-rec conference on post-disaster reconstruction*, May 17-19, 2006. Florence, Italy.

- Ozerdem, A. and G. Rufini 2013. L'Aquila's Reconstruction Challenges: Has Italy Learned From Its Previous Earthquake Disasters? *Disasters* 37(1): 119-43.
- Padovani, C. 2010. Citizens' Communication and the 2009 G8 Summit in L'Aquila, Italy. *The International Journal of Communication* 4:416-439.
- Palen, L. and S.B. Liu 2007. Citizen communications in crisis: Anticipating a future of ICT-supported participation. In: Proceedings from the CHI Conference, San Jose, CA (pp. 727-736). New York, ACM Press.
- Palen, L., M.A. Kenneth, G. Mark, J. Martin, D. Sicker, D. M. Palmer and D. Grunwald 2010. A Vision for Technology-Mediated Support for Public Participation & Assistance in Mass Emergencies & Disasters. *Association of Computing Machinery and British Computing Society's 2010 Conference on Visions of Computer Science*, Swinton, UK, 1-12
- Palenchar, M. 2009. Historical Trends of Risk and Crisis Communication. In *Handbook of Risk and Crisis Communication*. In R. Heath and D. O'Hair (Eds). Routledge: New York: 31-52
- Palttala, P., C. Boano, R. Lund and M. Vos, M. 2012. Communication Gaps in Disaster Management: Perceptions by Experts from Governmental and Non-Governmental Organizations. *Journal of Contingencies and Crisis Management* 20(1): 2-1
- Pappa, D. and L.K. Stergioulas 2006. G2C AND C2G: Emerging Principles and Architectures in E-government and E-participation'. Paper presented at the *eGovernment Workshop '06 (eGOV06)*, September 11, 2006, Brunel University, London, UK.
- Paton D. and D. Johnston 2015. The Christchurch earthquake: integrating perspectives from diverse disciplines. *International Journal of Disaster Risk Reduction* 14:1–5

- Paton, D. 2008. Risk communication and natural hazard mitigation: how trust influences its effectiveness. *International Journal of Global Environmental Issues* 8(1/2): 2-6
- Pattaro A.F. and S. Tripi 2013. (Re)Building a smart city: The role of local ICT-based services in emergency response and recovery. The case of earthquakes in Emilia-Romagna region. Paper presented at *the EGPA Conference*, 11-13 September 2013, Edinburgh, UK.
- Pavan, F. 2013. I social media nella Pubblica Amministrazione. Online report. Retrieved on June 28, 2015. Available at: http://datastorage02.maggioli.it/data/docs/www.egov.maggioli.it/Francesco_Pavan_dossier_i_social_media_nella_Pubblica_Amministrazione.pdf
- Pechta, L. E., D.C. Brandenburg and M.W. Seeger 2010. Understanding the Dynamics of Emergency Communication: Propositions for a Four-Channel Model. *Journal of Homeland Security and Emergency Management* 7(1): 1-8
- Pelling, M. and K. Dill 2010. Disaster Politics: Tipping Points For Change in The Adaptation of SocioPolitical Regimes. *Progress in Human Geography* 34(1): 21-37
- Perry R.W. and M.K. Lindell 1997. Principles for managing community relocation as a hazard mitigation measure. *Journal of Contingencies and Crisis Management* 5(1): 49-59
- Pescaroli, G., L. Pietrantonio and E. Saccinto 2012. Behavioural reactions to the Emilia-Romagna earthquake and implications for risk management. *Autonomie Locali e Servizi Sociali* 3:505-514.
- Peters, R.G., V.T. Covello and D.B. McCallum 1997. The Determinants of Trust and Credibility in Environmental Risk Communication: An Empirical Study. *Risk Analysis* 17(1): 43-54.

Peters, T. 2014. New Zealand: Three years after the Christchurch earthquake. *World Socialist Website*. Article published on 22 February 2014. Available at <https://www.wsws.org/en/articles/2014/02/22/chch-f22.html>

Philipsborn, C. 2005. The disaster recovery process, in: Natural Hazards Research and Applications Center (Eds), *Holistic Disaster Recovery- Ideas for Building Local Sustainability after a Natural Disaster*. Natural Hazard Center, University of Colorado, Boulder, Colorado. Available online at: <http://www.riskinstitute.org/peri/images/file/HDR.pdf>

Phillips, B. D. 2009. *Disaster recovery*. Boca Raton, FL: CRC Press.
Phillips, B.D. 2014. *Qualitative disaster research*, Oxford, UK: Oxford University Press.

Platt, S. 2012. ReBuildDD Field Trip February 2012. *Reconstruction In New Zealand Post 2010-11 Christchurch Earthquakes*. Cambridge Architectural Research online report. Retrieved on November 2, 2015. Available at: http://www.carltd.com/sites/carwebsite/files/Reconstruction%20New%20Zealand%20Post%202010-11%20Christchurch%20Earthquakes_0.pdf

Platt, S. and E. So 2016. Speed or deliberation: a comparison of post-disaster recovery in Japan, Turkey, and Chile. *Disasters* (in press). DOI 10.1111/disa.12219 Available at: <http://onlinelibrary.wiley.com/doi/10.1111/disa.12219/abstract>

Potter, S., J.S. Becker, D.M. Johnston and K.P. Rossier 2015. An overview of the impacts of the 2010-2011 Canterbury earthquakes. *International Journal of Disaster Risk Reduction* 14(1): 6-14

Provincia Bologna 2012 *Contributi per gli enti locali e le imprese colpite dal sisma del 20 e 29 maggio 2012*. Provincia Bologna online article. Retrieved on February 10, 2016. Available at: <http://www.cittametropolitana.bo.it/imprese/Engine/RAServePG.php/P/3064113603>

03/T/Contributi-per-gli-enti-locali-e-le-imprese-colpite-dal-sisma-del-20-e-29-maggio-2012

Przeworski, A. and H. Teune 1970. *The Logic of Comparative Social Inquiry*. New York: Wiley Interscience.

Putnam. 1993. *Making Democracy Work*. Princeton: Princeton University Press.

Pyles L. 2007. Community organizing for post-disaster social development
Locating social work. *International Social Work* 50(3): 321-333.

Quan-Haase, A. and A. Young 2010. Uses and Gratifications of Social Media: A
Comparison of Facebook and Instant Messaging. *Bulletin of Science Technology &
Society* 30(5): 350-361.

Quarantelli, E.L. 1982. General and particular observations on sheltering and
housing in American disasters. *Disasters* 6(4): 277-281

Quarantelli, E. L. 1986. *Disaster Crisis Management*. PRELIMINARY PAPER
#113. Newark, DE: Disaster Research Center, University of Delaware. Available at:
<http://udspace.udel.edu/bitstream/handle/19716/487/PP113.pdf?sequence=3>

Quarantelli, E. 1987. *The Social Science Study of Disasters and Mass
Communications*. Preliminary paper #116, Newark, DE.: Disaster Research
Center, University of Delaware. Available at:
<http://udspace.udel.edu/bitstream/handle/19716/1082/PP116.pdf?sequence=3>

Quarantelli, E. 1989. *Disaster recovery: Comments on the literature and a mostly
annotated bibliography*. Miscellaneous Report #44. Newark, DE.: Disaster
Research Center, University of Delaware. Available at:
<http://udspace.udel.edu/handle/19716/1331>

Quarantelli, E.L. 1985. *Emergent Citizen Groups in Disaster Preparedness and
Recovery Activities*. Final Project Report (Report No. 33/1985). Newark, DE:

Disaster Research Center, University of Delaware. Available at:

<http://udspace.udel.edu/bitstream/handle/19716/1206/FPR33.pdf?sequence=1>

Quarantelli, E.L. 1991. *Lessons from research: findings on mass communication system behavior in the pre, trans, and postimpact periods of disasters*, Preliminary Paper #160, Newark, DE: University of Delaware, Disaster Research Center.

Available at

<http://dspace.udel.edu/bitstream/handle/19716/532/PP160.pdf?sequence=3>

Quarantelli, E.L. 1995. Patterns of sheltering and housing in US disasters. *Disaster Prevention and Management: An International Journal* 4(3): 43 – 53

Quarantelli, E.L. 1997. Problematical Aspects of the Information/Communication Revolution for Disaster Planning and Research: Ten Non–Technical Issues and Questions. *Disaster Prevention and Management* 6(2): 94-106.

Quarantelli, E.L. 1999. *The disaster recovery process: what we know and do not know from research*. Preliminary Paper #286. Delaware, USA: Disaster Research Center, University of Delaware. Available at:

<http://udspace.udel.edu/handle/19716/309>

Ragin C.C. 1999. Using Qualitative Comparative Analysis to Study Causal Complexity. *Health Services Research* 34(5): 1225–39

Ragin, C.C. 1987. *The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press.

Ragin, C.C. 1997. Turning The Tables: How Case-Oriented Research Challenges Variable-Oriented Research. *Comparative Social Research* 16:27-42

Redattore Sociale 2012. Il terremoto e I social media: le notizie, gli aiuti e gli anelli mancanti. *Redattore Sociale*. Article published on 4 June 2012. Available at

<http://www.redattoresociale.it/Notiziario/Articolo/396919/Il-terremoto-e-i-social-media-le-notizie-gli-aiuti-e-gli-anelli-mancanti>

Regione Emilia-Romagna 2014a. *A due anni dal sisma: il racconto di cosa si è fatto e di cosa si sta facendo*. Regione Emilia-Romagna online report. Retrieved on May 8, 2015. Available at: <http://www.regione.emilia-romagna.it/terremoto/a-due-anni-dal-sisma/a-due-anni-dal-sisma>

Regione Emilia-Romagna 2014b. *Ricostruire l'emergenza – Cronologia della gestione istituzionale del terremoto in Emilia e sintesi tematica*. Regione Emilia-Romagna online report. Retrieved on December 31, 2015. Available at: <http://www.regione.emilia-romagna.it/urp/allegati/Dossiersisma.pdf>

Regione Emilia-Romagna 2015. *La ricostruzione di un territorio. Tre anni di lavoro dopo il terremoto*. Regione Emilia-Romagna online report. Retrieved on May 3, 2016. Available at: <http://www.regione.emilia-romagna.it/terremoto/tre-anni-di-lavoro-dopo-il-terremoto>

Regione Emilia-Romagna website (a) (no date). *Osservatorio della Partecipazione*. Online document. Retrieved on April 4, 2016. Available at: <http://osservatoriopartecipazioneer.ervet.it/ChiSiamo.asp>

Regione Emilia-Romagna website (b) (no date). *Piano Telematico dell'Emilia-Romagna*. Online document. Retrieved on April 4, 2016. Available at: <http://digitale.regione.emilia-romagna.it/piter/doc/piter-20112013>

Regione Emilia-Romagna website 2014. *Usa di Internet*. Regione Emilia-Romagna online report. Retrieved on November 1, 2016. Available at: <http://digitale.regione.emilia-romagna.it/dati/temi/uso-di-internet#-span-style--line-height----em---relazioni-con-la-pa-----span->

Reinhardt, G.Y. 2015. Race, Trust, and Return Migration The Political Drivers of Post-disaster Resettlement. *Political Research Quarterly* 68(2): 350-362

- Reiss, C. L. 2012. Introduction to the Special Issue on Disaster Recovery. *International Journal of Mass Emergencies and Disasters* 30(2): 120-122
- Renn, O. and D. Levine 1991. Credibility and trust in risk communication. In: R.E. Kasperson, (Eds), *Communicating risks to the public: international perspectives*. Dordrecht, Kluwer: 175-217.
- Reuters, C., A. Marx and V. Pipek 2011. Social Software as an Infrastructure for Crisis Management: A case study about current practice and potential usage. Paper presented at the 8th ISCRAM Conference, 8-11 May 2011, Lisbon, Portugal.
- Reynolds, B. and W. Seeger 2005. Crisis and emergency risk communication as an integrative model. *Journal of Health Communication* 10(1): 43-55.
- Rice, R. and D. Case 1983. Electronic Message Systems in the University: A Description of Use and Utility. *Journal of Communication* 33(1): 131-152
- Rinne, T., D. Steel and J. Fairweather 2012. Hofstede and Shane Revisited- The Role of Power Distance and Individualism in National-Level Innovation Success. *Cross-Cultural Research* 46(2): 91-108
- Risk and Disaster Communication Centre 2015. *Report on the Workshop "Disaster Communication Redesigned" A Cross-Disciplinary Agenda for Disaster, Crisis, and Risk Communication Research*, November 10 - 11, Lexington, Kentucky
-
- Riva, G. 2002. The sociocognitive psychology of computer-mediated communication: the present and future of technology-based interactions. *Cyberpsychology Behaviour* 5(6): 581-98
- Rivera, J.D. and A. E. Nickels 2014. Social Capital, Community Resilience, and Faith-Based Organizations in Disaster Recovery: A Case Study of Mary Queen of Vietnam Catholic Church. *Risk, Hazards & Crisis in Public Policy* 5(2): 178-211

- Rocha, J., I. Becerra-Fernandez, W. Xia and A. Gudi 2009. Dealing with Task Uncertainty in Disaster Management: The Role of Knowledge Sharing for Exploration and Exploitation.. Paper presented at the *American Conference on Information Systems*.. 6-9 August 2009, San Francisco, California.
- Rogers, E. 1995. *Diffusion of innovations* (4th ed.). New York:Free Press,
- Rose, A. 2004. Defining and measuring economic resilience to disasters. *Disaster Prevention and Management: An International Journal* 13(4): 307 – 314
- Ross, C., E. Orr, M. Siscic, J.M. Arseneault, M.G. Simmering and R. Orr 2009. Personality and motivations associated with Facebook use. *Computers in Human Behavior* 25(2): 578-586.
- Rossetto T., D. Alexander, E. Verrucci, I. Ioannou, R. Borg, J. Melo, B. Cahill, and I. Kongar 2012. *The 20th May 2012 Emilia-Romagna earthquake*, EPICentre field observation report. Retrieved on January 8, 2015. Available at: <http://www.eqclearinghouse.org/2012-05-20-italy/files/2012/06/EPICentre-Report-EPI-FO-2005121.pdf>
- Rubin, C. B., M.D. Saperstein and D.G. Barbee 1985. *Community Recovery from a Major Natural Disaster*. Monograph #41. Boulder, CO: University of Colorado, Institute of behavioral science. Available at http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1086&context=fmhi_publications
- Rubin, C.B. 1991. Recovery from disaster. In T. E. Drabek & G. J. Hoetmer (Eds.), *Emergency management: Principles and practice for local governments*. Washington, DC: International City Management Association: 224– 259
- Rubin, C.B. and D.G. Barbee 1985. Disaster recovery and hazard mitigation: Bridging the intergovernmental gap. *Public administration review* 45:57-63
- Russo, M., P. Silvestri, G. Bonifati, E. Gualandri, F. Pagliacci, A. Pattaro, A. Pedrazzoli, S. Pergetti, M. Ranuzzini, M.I Reverberi, G.i Solinas, P. Vezzani

(2016). *Innovation and development after the earthquake in Emilia*. DEMB Working paper n.81. Available at

http://merlino.unimo.it/campusone/web_dep/wpdemb/0081.pdf

Sadiqi, Z., V. Coffey and B. Trigunarsya 2011. Post-disaster Housing Reconstruction: Challenges for community participation. Paper presented at the *International Conference on Building Resilience: Interdisciplinary approaches to disaster risk reduction, and the development of sustainable communities*, 19-21 July 2011, Heritance Kandalama, Sri Lanka.

Santos, F. M. and K.M. Eisenhardt 2004. Multiple Case Study. In: M.S. Lewis-Beck, A. Bryman & T. Futing Liao (eds), *The SAGE Encyclopedia of Social Science Research Methods*. Thousand Oaks: Sage Publications: 685.

Scanlon, J. 1980. The Media and the 1978 Terrace Floods: An Initial Test of a Hypothesis. In: Committee on Disasters and the Mass Media (Eds), *Disasters and the Mass Media*, Washington, DC, National Academy of Sciences: 254-263.

Scanlon, J. 2007. Unwelcome Irritant or Useful Ally? The Mass Media in Emergencies. In H. Rodríguez, E. L. Quarantelli & R. R. Dynes (Eds.), *Handbook of Disaster research*. New York, Springer: 413-429.

Scanlon, J., G. Morton and R. Luuko 1978. Media Coverage of Crisis: Better than Reported, Worse than Necessary. *Journalism Quarterly* 55: 68-72.

Schell, C. 1992. *The Value of the Case Study as a Research Strategy*. Manchester Business School paper. Retrieved on June 8, 2016. Available at: <http://finance-mba.com/Case%20Method.pdf>

Schilderman, T. and M. Lyons 2011. Resilient dwellings or resilient people? Towards people-centred reconstruction. *Environmental Hazards* 10(3-4): 218-231.

- Schillewaert, N. and P. Meulemeester 2005. Comparing response distributions of offline and online data collection methods. *International Journal of Market Research* 47(2): 163-178.
- Schultz, F., S. Utz and A. Goritz 2011. Is the medium the message? Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. *Public Relations Review* 37(1): 20-27
- Schwab, J., K.C. Topping, C.C. Eadie, R.E. Deyle and R.A. Smith 1998. *Planning for Post-Disaster Recovery and Reconstruction*. PAS Report 483/484 (FEMA 421), Chicago, American Planning Association.
- Seeger, M.W. 2006. Best Practices in Crisis Communication: An Expert Panel Process. *Journal of Applied Communication Research* 34(3): 232-244
- Sellnow, T., M. Seeger and R.R. Ulmer 2002. Chaos theory, informational needs and the North Dakota floods. *Journal of Applied Communication Research* 30(3): 269–292.
- Semaan, B and G. Mark 2012. Facebooking' Towards Crisis Recovery and Beyond: Disruption as an Opportunity. Paper presented at the *ACM conference on Computer supported cooperative work*, 11-15 February 2015, Seattle, WA.
- Semaan, B. and G. Mark 2011. Technology-mediated social arrangements to resolve breakdowns in infrastructure during ongoing disruption. *Journal ACM Transactions on Computer-Human Interaction* 18(4), DOI [10.1145/2063231.2063235](https://doi.org/10.1145/2063231.2063235)
- Seville, E., S. Giovinazzi, J. Stevenson, J. Vargo, and C. Brown 2014. Disruption and Resilience: How Organisations coped with the Canterbury Earthquakes. EERI Research Report 2014/002. Retrieved on 27 July 2016. Available at: http://www.resorgs.org.nz/images/stories/pdfs/Organisationsfacingcrisis/disruption_and_resilience.pdf

- Shaluf, I.M., F. Ahmadun, A. M. Said, 2003. A review of disaster and crisis. *Disaster Prevention and Management: An International Journal*, 12(1): 24-32
- Shane, S. 1992. Why do some societies invent more than others? *Journal of Business Venturing* 7(1): 29–46.
- Shane, S. 1993. Cultural influences on national rates of innovation. *Journal of Business Venturing* 8(1): 59–73
- Shklovski, I., M. Burke, S. Kiesler, and R. Kraut 2010. Technology Adoption and Use in the Aftermath of Hurricane Katrina in New Orleans. *American Behavioral Scientist* XX(X) 1–19
- Sigma Consulting 2012. *Indagine conoscitiva sul rapporto tra Social Network, Imprese, Cittadini e Pubblica Amministrazione in Provincia di Pesaro e Urbino*. Sigma Consulting online report. Retrieved on January 10, 2016. Available at: http://www.provincia.pu.it/fileadmin/grpmnt/1051/Ricerca_Social_Network_2.pdf
- Simons, G. 2016. Projecting failure as success: Residents' perspectives of the Christchurch earthquakes recovery. *Cogent Social Sciences* 2, DOI: [10.1080/23311886.2015.1126169](https://doi.org/10.1080/23311886.2015.1126169)
- Smith G. 2011. *Planning for post-disaster recovery: A review of the United States Disaster Assistance Framework*. Washington, DC: Island Press
- Smith, B.G. 2010. Socially distributing public relations: Twitter, Haiti, and interactivity in social media. *Public Relations Review* 36: 329-335.
- Smith, G. and D. Wenger 2006. Sustainable disaster recovery: Operationalizing an existing agenda. In H. Rodriguez, E. Quarantelli & R. Dynes (Eds.), *Handbook of disaster research*. New York, Springer: 234-257.

- Smith, G. and T. Birkland 2012. Building a Theory of Recovery: Institutional Dimensions. *International Journal of Mass Emergencies and Disasters* 30(2): 147–70.
- SocialmediaNZ 2011. New Zealand Police: Best use of Social Media Award – 24 June 2011. Available online at <https://socialmedianz.com/social-media-spotlight/2011/06/24/new-zealand-police-best-use-of-social-media-award-june-winner/>
- Sommerfeldt, E.J. 2015. Disasters and Information Source Repertoires: Information Seeking and Information Sufficiency in Postearthquake Haiti. *Journal of Applied Communication Research* 43(1): 1-2
- Song, C. and J. Lee 2016. Citizens' Use of Social Media in Government, Perceived Transparency, and Trust in Government. *Public Performance & Management Review* 39(2): 430-453
- Spears, R., M. Lea and T. Postmes 2001. Social psychological theories of computer-mediated communication: Social pain or social gain? In: W. P. Robinson and H. Giles (eds.) *The New Handbook of Language and Social Psychology*, Wiley, Chichester: 601-623
- Spence, P.R, D. Westerman, P.D. Skalski, M. Seeger, T.L. Sellnow, and R.R. Ulmer 2006. Gender and Age Effects on Information-Seeking after 9/11. *Communication Research Reports* 23(3): 217-223
- Spence, P.R, K. Lachlan and D.R. Griffin 2007a. Crisis communication, race, and natural disasters. *Journal of Black Studies* 37(4): 539-554
- Spence, P.R., K. Lachlan, J.M. Burke and M.W. Seeger 2007b. Media Use and Information Needs of the Disabled During a Natural Disaster. *Journal of Health Care for the Poor and Underserved* 18(2): 394-404

- Springgate B.F., C. Allen, C. Jones, S. Lovera, D. Meyers, L. Campbell, L.A. Palinkas and K.B. Wells 2009. Rapid community participatory assessment of health care in post-storm New Orleans. *American Journal of Preventive Medicine* 37(6): 237-243
- Sproull, L. and S. Kiesler 1986. Reducing social context cues: Electronic mail in organizational communication. *Management Science* 32: 1492–1512.
- Stallings, R.A. 1997. *Sociological Theories and Disaster Studies*, Preliminary paper. #249, Newark, DE: University of Delaware, Disaster Research Center. Available at: <http://dspace.udel.edu/bitstream/handle/19716/135/PP249-Sociological+Theories.pdf?sequence=1>
- Stallings, R.A. and E.L. Quarantelli 1985. Emergent Citizen Groups and Emergency Management. *Public Administration Review* 45:93-100
- Starbird K. and L. Palen 2010. Pass It On?: Retweeting in Mass Emergency. Paper presented at the *7th International ISCRAM Conference*, 2-5 May 2010, Seattle, WA.
- Steelman, T.A, S.M. McCaffrey, A. Knox Velez and J.A Briefel 2015. What information do people use, trust, and find useful during a disaster? Evidence from five large wildfires. *Natural Hazards* 76(1): 615-634
- Stehr, S. 2001. Community recovery and reconstruction following disasters. In A. Farazmand (Eds.), *Handbook of crisis and emergency management*. Marcel Dekker, New York: 419- 431
- Stein, L. 2013. Policy and Participation on Social Media: The Cases of YouTube, Facebook, and Wikipedia. *Communication, Culture & Critique* 6(3): 353–371
- Stephens, K.K. 2007. The successive use of information and communication technologies at work. *Communication Theory* 17: 486-509

Stevenson, J.R., H. Kachali, Z. Whitman, E. Seville, J. Vargo and T.M. Wilson 2011. Preliminary Observations of the Impacts the 22 February Christchurch Earthquake is having on Organisations and the Economy: a report from the field (22 February- 22 March 2011). Online report. Retrieved on July 4, 2015. Available at: <http://hdl.handle.net/10092/9499>

Storr, V.H. and S. Haeffele-Balch 2010. Can Decentralized Bottom-Up Post-Disaster Recovery Be Effective? Working Paper no. 10. Retrieved on July 10, 2016. Available at: <http://mercatus.org/sites/default/files/publication/Can%20Decentralized%20Bottom-Up%20Post-Disaster%20Recovery%20be%20Effective.pdf>

Stuff 2015. Latest announcement on Cera's replacement raises other questions. *Stuff*. Article published on September 28, 2015. Available at: <http://www.stuff.co.nz/the-press/opinion/72414718/Latest-announcement-on-Ceras-replacement-raises-other-questions>

Stylianou, G. and L. Cairns 2015. Gerry Brownlee retains power in Greater Christchurch Regeneration Bill. *Stuff*. Article published on October 23, 2015. Available at: <http://www.stuff.co.nz/the-press/business/the-rebuild/73303680/Gerry-Brownlee-retains-power-in-Greater-Christchurch-Regeneration-Bill>

Suchman, L.A. 1987. *Plans And Situated Actions: The Problem Of Human-Machine Communication*. Cambridge: Cambridge Press

Sul Panaro 2014. Ricostruzione pubblica e privata a due velocità diverse: come mai? , se lo chiede il comitato Dal Basso alla Bassa. *Sul Panaro*. Article published online on 27 March 2014. Available at: <http://www.sulpanaro.net/2014/03/ricostruzione-pubblica-e-privata-a-due-velocita-diverse-come-mai-se-lo-chiede-il-comitato-dal-basso-alla-bassa/>

Sutton J, L. Palen and I. Shklovski 2008. Backchannels on the front lines: Emergent uses of social media in the 2007 Southern California Wildfires. In: F.

Fiedrich & B. Van de Walle, (eds). *Proceedings of the 5th International ISCRAM Conference*. Washington DC.,USA: 624-635.

Sutton, J. 2010. Twittering Tennessee: Distributed Networks and Collaboration Following a Technological Disaster. Paper presented at *the 7th International ISCRAM Conference*, 2-5 May, Seattle, USA.

Sutton, J. 2012. When Online Is Off: Public Communications Following the February 2011 Christchurch, NZ, Earthquake. In: L. Rothkrantz, J. Ristvej & Z. Franco (eds). *Proceedings of the 9th International ISCRAM Conference - Vancouver, Canada*: 1-6

Swaffield, S. 2013. Place, Culture and Landscape After the Christchurch Earthquake. In Sykes, H (Eds), *Space Place and Culture*, 1 – 26. Albert Park: Future Leaders. Web.

Sword-Daniels, V., J. Twigg, T. Rossetto and D.M. Johnston 2016. Unpacking Long-term Disaster Recovery Processes: A Case Study of the Healthcare System in Montserrat, West Indies. *International Journal of Mass Emergencies and Disasters* 34(1): 113-142

Tagliacozzo, S and C. Arcidiacono, C. 2016. Social media as participatory tools in post-disaster reconstruction: re-negotiating power relationships and achieving self-empowerment. *International Journal of Mass Emergencies and Disasters* 34(2): 317-340.

Tagliacozzo, S. and C. Arcidiacono 2015. Do ICTs help to maintain social capital in the disaster recovery phase? A case study of L'Aquila earthquake. *Journal of Community Informatics* 11(1): 1-16

Tagliacozzo, S. and M. Magni 2016. Communicating with communities (CwC) during post-disaster reconstruction: an initial analysis. *Natural Hazards* 84(3): 2225-2242

- Tajfel, H. and J.C. Turner 1986. The social identity theory of intergroup behaviour. In S. Worchel & W. G. Austin (Eds.), *Psychology of Intergroup Relations*. Chicago, Nelson-Hall: 483-507
- Tapia, A.H., K. Bajpai, B.J. Jansen and J. Yen 2011. Seeking the Trustworthy Tweet Can Microblogged Data Fit the Information Needs of Disaster Response and Humanitarian Relief Organizations. Paper presented at the the 8th International ISCRAM Conference, May 1-10, Lisbon, Portugal.
- Taylor, M. and D.C. Perry, D.C. 2005. Diffusion of traditional and new media tactics in crisis communication. *Public Relations Review* 31(2): 209-217
- Tgsky24. 2012. Battuta sul terremoto: Gaffe e scuse di Groupalia su Twitter. TgSky24. Article published on May 29, 2012. Available at http://tg24.sky.it/tg24/cronaca/photogallery/2012/05/29/terremoto_emilia_groupalia_gaffe_twitter.html
- Thayer, S.E and S. Ray 2006. Online communication preferences across age, gender, and duration of Internet use. *CyberPsychology & Behavior* 9(4): 432-440
- Tierney, K. 2009. Disaster Response: Research Findings and Their Implications for Resilience Measurement . CARRI Research Report 6. Available at <https://pdfs.semanticscholar.org/d2ee/86783be7af7cf2b28d536d226fe6f85ff0c8.pdf>
- Tierney, K. and A. Oliver-Smith 2012. Social Dimensions of Disaster Recovery. *International Journal of Mass Emergencies and Disasters* 30(2): 123–146.
- Tierney, K.J. 2007. From the Margins to the Mainstream? Disaster Research at the Crossroads. *Annual Review of Sociology* 33(1): 503-525
- Trist, E. and K. Bamforth 1951. Some social and psychological consequences of the longwall method of coal getting. *Human Relations* 4: 3-38

Turner, J.C. 1987. A self-categorization theory. In J. C. Turner, M. A. Hogg, P. J. Oakes, S.D. Reicher & M. S. Wetherell (Eds), *Rediscovering the Social Group: A self-categorization Theory*. Oxford: Blackwell

Turner, R.H. 1994. Rumor as Intensified Information Seeking: Earthquake Rumors in China and the United States. In R. R. Dynes & K. J. Tierney (Eds), *Disasters, Collective Behavior, and Social Organization*, University of Delaware Press, Newark, DE: 244–256

Twigg, J. 2003. The Human Factor in Early Warnings: Risk Perception and Appropriate Communications. In J. Zschau & A. Küppers (Eds), *Early Warning Systems for Natural Disaster Reduction*, Springer, Heidelberg: 19-26

Twigg, J. 2006. *Tecnology, Post-Disaster Housing Reconstruction and Livelihood Security*. Benfield Hazard Research Centre, Disaster Studies Working Paper 15, (January 2002/May 2006), Retrieved on June 10, 2016. Available at: https://www.ucl.ac.uk/hazardcentre/resources/working_papers/working_papers_folder/wp15

Twigg, J. 2015a. Introduction to Virtual Issue on Disaster Recovery, *Disasters*. Available at: [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1467-7717/homepage/VirtualIssuesPage.html#RECOVERY](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-7717/homepage/VirtualIssuesPage.html#RECOVERY)

Twigg, J. 2015b. Communications, information, education. In: *Disaster Risk Reduction. Good practice review*. Overseas Development Institute, London (UK): 189-210

UNDP 2008. *UNDP Policy on Early Recovery Bureau for Crisis Prevention and Recovery*. Online report. Available at: <https://relief2recovery.files.wordpress.com/2012/01/undp-on-early-recovery.pdf>

UNOCHA 2014. *OCHA on message: Communications with communities*. UNOCHA online report. Retrieved on December 10, 2015. Available at: https://docs.unocha.org/sites/dms/Documents/141017_OOM-

[CommunicationwithCommunities_eng%202014_FINAL.pdf](#)

Vaccari, C., A. Valeriani, P. Barberà and J. Tucker 2013. Social Media and Political Communication A survey of Twitter users during the 2013 Italian general Election. *Rivista Italiana di Scienza Politica* 43(3): 381-410

Vallance, S. 2011. Early Disaster Recovery: A Guide for Communities. *Australasian Journal of Disaster and Trauma Studies* 2011–2:19-25

Vallance, S. 2012. Urban resilience: Bouncing back, coping, thriving Paper presented at EARTH: FIRE AND RAIN Australian & New Zealand Disaster and Emergency Management Conference Brisbane – 16 – 18, April 2012

Vallance, S. 2014. Disaster recovery as participation: lessons from the Shaky Isles. *Natural Hazards* 75(2): 1287-1301

Vallance, S. and S. Carlton 2015. First to respond, last to leave: Communities' roles and resilience across the '4Rs'. *International Journal of Disaster Risk Reduction* 14(1): 27–36

Veil, S.R., T. Buehner and M.J. Palenchar 2011. A Work-In-Process Literature Review: Incorporating Social Media in Risk and Crisis Communication. *Journal of Contingencies and Crisis Management* 19(2): 100-122

Venkatesh, V., J.Y. L.Thong, J.Y.L, F.K.Y. Chan, F.K.Y. and P.J.H.Hu, 2016. Managing citizens' uncertainty in e-government services: The mediating and moderating roles of transparency and trust. *Information Systems Research* 27(1): 87-111

Vieweg, S., L. Palen, S.B. Liu, A.L.Hughes and J. Sutton 2008. Collective Intelligence in Disaster: Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shooting. In: F. Fiedrich & B. Van de Walle (Eds) *Proceedings*

of the Information Systems for Crisis Response and Management Conference (ISCRAM 2008), Washington D.C., USA: 44-54

Virtual Social Media Working Group and DHS First Responders Group 2012. *Community Engagement Guidance and Best Practices. Department of Homeland Security report*, Retrieved on May 4, 2015. Available at: <https://www.hsdl.org/?view&did=722650>

Virtual Social Media Working Group and DHS First Responders Group 2013. *Lessons Learned: Social Media and Hurricane Sandy. Department of Homeland Security Report* Retrieved on May 4, 2015. Available at: <http://www.firstresponder.gov/TechnologyDocuments/Lessons%20Learned%20Social%20Media%20and%20Hurricane%20Sandy.pdf>

von Lubitz, D. K., J. E., Beakley and F. Patricelli 2008. „All hazards approach“ to disaster management: The role of information and knowledge management, Boyd“s OODA Loop, and network-centricity. *Disasters* 32(4): 561-585.

Vygotsky, L. S. 1978. *Mind in society: the development of higher psychological processes*. Cambridge: Harvard University Press.

Waimakariri District Council 2015. Residential Red Zone Future Use. Online report. Retrieved online at May 10, 2016. Available at: http://www.redzoneplan.nz/_data/assets/pdf_file/0017/8801/WDC10805_CANVAS-Discussion-Doc6.pdf

Walsh, B. 2014. The Seismic Link between Fracking and Earthquakes. *The Time*. Published online on May 1, 2014. Available at: <http://time.com/84225/fracking-and-earthquake-link/>

Walther, J. B 1992. Interpersonal Effects in Computer-Mediated Interaction. *Communication Research* 19(1): 52-90.

Warkentin, M., D. Gefen, P. Pavlou and G.Rose 2002. Encouraging Citizen Adoption of eGovernment by Building Trust. *Electronic Markets* 12(3): 157-162.

Warren A.M., A. Sulaiman A. and N.I.Jafaar 2014. Social media effects on fostering online civic engagement and building citizen trust and trust in institutions. *Government Information Quarterly* 31(2): 291-301.

Waters, R.D. and J.M. Williams 2011. Squawking, tweeting, cooing, and hooting: analyzing the communication patterns of government agencies on Twitter. *Journal of Public Affairs* 11(4): 353-363.

Wearesocial 2015. *Digital, Social & Mobile 2015: Tutti I Numeri Globali, E Italiani*. 22 January 2015. Available at <https://wearesocial.com/it/report-ricerche/digital-social-mobile-2015-tutti-numeri-globali-italian>

Webb, C. and D. McEntire 2012. Emergency Management in New Zealand; Potenzial Disasters and Opportunities for Resilience. In: D. Mc Entire, (Eds), *Comparative Emergency Management Book*, FEMA Emergency Management Institute, Emmitsburg, Maryland. Available at: <https://training.fema.gov/hiedu/aemrc/booksdownload/compemmgmtbookproject/>

Webb, G., K. Tierney and J. Dahlhamer 2002. Predicting Long-Term Business Recovery From Disaster: A Comparison Of The Loma Prieta Earthquake And Hurricane Andrew. *Environmental Hazards* 4:45-58.

Weber, M. 1958. The three types of legitimate rule. *Berkeley Publications in Society and Institutions* 4(1): 1-11.

Weiner, B. 1974. *Achievement motivation and attribution theory*. Morristown, N.J.: General Learning Press.

Weiser, E.B. 2004. Gender Differences in Internet Use Patterns and Internet Application Preferences: A Two-Sample Comparison. *CyberPsychology & Behavior* 3(2): 167-178

Wenger, D. 1985. *Mass Media and Disasters*, Preliminary Paper #98, Disaster Research Center, University of Delaware. Retrieved on May 6, 2016. Available at: <http://dspace.udel.edu/bitstream/handle/19716/474/PP98.pdf?sequence=3>

Wenger, D. and C. Prater 2013. Role and Nature of Emergent Organizations in Disaster Recovery. PLAN 647: Disaster Recovery & Mitigation PRATIK MHATRE Available at <https://pratikmhatre99.files.wordpress.com/2013/11/role-and-nature-of-emergent-organizations-in-disaster-recovery.pdf>

White, J., L. Palen and K. Anderson 2014. Digital Mobilization in Disaster Response: The Work & Self-Organization of On-Line Pet Advocates in Response to Hurricane Sandy. In: S. Fussell & W. Lutters, *Proceedings of the ACM 2014 Conference on Computer Supported Cooperative Work*, New York, NY, ACM: 866-876

Williams, D.E. and B.A. Olaniran 1998. Expanding the crisis planning function: Introducing elements of risk communication to crisis communication practice. *Public Relations Review* 24(3): 387-400

Wisner B. and HR Luce 1993. Disaster vulnerability: scale, power and daily life. *GeoJournal*. 30(2), 127–140

World Bank. 2010. Communication in Post-Disaster Reconstruction. In: A. K. Jha, J. D. Barenstein, P. M. Phelps, D. Pittet & S. Sena (Eds). *Safer Homes, Stronger Communities. A Handbook for Reconstructing after Natural Disasters*, GFDRR, Washington D.C., USA: 45-58

Worthy, B. and S.G. Grimmelikhuisen 2012. How political culture and institutions shape transparency and trust in the UK and in the Netherland. Utrecht University

Repository. Retrieved on 25 October, 2014. Available at:
<https://dspace.library.uu.nl/handle/1874/252037>

Wray R.J., M.W. Kreuter, H. Jacobsen, B. Clements and R.G. Evans 2004. Theoretical perspectives on public communication preparedness for terrorist attacks. *Fam Community Health* 27(3): 232-241

Wu J.Y. and M.K. Lindell 2004. Housing reconstruction after two major earthquakes: the 1994 Northridge earthquake in the United States and the 1999 Chi-Chi earthquake in Taiwan. *Disasters* 28(1): 63-81.

Yandong, Z. and S. Changhui. 2015. The structure and change of social trust during post-disaster reconstruction. In: L. Peilin & L. Roulleau-Berger (eds). *Ecological Risks and Disasters - New Experiences in China and Europe*, Routledge, New York. NY

Yates, D. and S. Pasquette 2011. Emergency knowledge management and social media technologies: A case study of the 2010 Haitian earthquake. *International Journal of Information Management: The Journal for Information Professionals* 31(1): 6-13

Yi, H. and J. Yang, 2014. Research trends of post disaster reconstruction: The past and the future. *Habitat International* 42:21–29

Yin, R. K. 1984 *Case study research: Design and methods* Newbury Park, CA: Sage.

Yin, R.K. 2009. *Case study research: Design and methods*, 4th edition, Newbury Park, CA: Sage

Yin, R.K. 2014. *Case study research: Design and methods*, 5th edition, Thousand Oak, CA: Sage

Zetter, R. and C. Boano 2009. Space and Place after Natural Disasters and Forced Displacement. In G. Lizarralde, C. Davidson & C. Johnson (eds) *Rebuilding after Disasters: From Emergency to Sustainability*, London, Taylor and Francis: 206 - 230

Zhang, J., W. Zou and M. Kumaraswamy 2015. Developing public private people partnership (4P) for post disaster infrastructure procurement. *International Journal of Disaster Resilience in the Built Environment* 6(4): 468 - 484

Zhang, Q. and E. Wang, E. 2010. Local Political Trust: The Antecedents And Effects On Earthquake Victims' Choice For Allocation Of Resources. *Social Behavior And Personality* 38(7): 929-940