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Exploring the Experiences of Disaster Memory Initiatives in Chile

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ABSTRACT

Chile is a country highly prone to disasters triggered by natural hazards, where half of the population is exposed to three or more of these threats. Oriented by the international agenda and national experience, the DRM public policy highlights participation and the distribution of responsibilities, which in turn are related to construction and socialization of knowledge. Local knowledge, particularly, can be relevant in terms of community resilience, being related to memory, a relevant but scarcely studied topic in disaster and memory studies. Thus, this case study explored the experiences of disaster memory initiatives carried out by civil society and local governments in Chile, based on in-depth semi-structured interviews. The results show two main themes: strategies, and tensions and challenges. The first one shows that the initiatives are mainly framed within the culture realm; are oriented by educative, reflective and informative purposes; and are diversely deployed in the public arena, where varied actors and resources revolved around the initiative´s dynamic development. Tensions and challenges refer to centralization, the emergency of disaster memory, operational difficulties and contested issues. Additionally, this study shows that most of the initiatives were indirectly influence or triggered by the 2010 earthquake and tsunami. The conclusions highlight three main points. Firstly, the initiatives can be conceived as the result of individual and/or social learning, acquiring specialized practices on the way, and have a current/potential role in processes of building, organizing and sharing disaster memory. Secondly, in terms of community resilience, the initiatives highlight the idea of community beyond the location, with memory as a social connector; and their potential is shown mostly in terms of social capital and information and communication. Finally, although the initiatives are currently focused on disaster preparedness, they also present experience and/or potential in terms of recovery, particularly regarding spiritual and mental health issues.

Keywords: memory, commemoration, disaster, community resilience, disaster's social dimension, Chile

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CONTENTS

ABBREVIATIONS AND ACRONYMS

CONAF: National Forest Corporation (Corporación Nacional Forestal)

CORFO: Chilean Economic Development Agency (Corporación de Fomento de la Producción)

DRM: Disaster Risk Management

DRR: Disaster Risk Reduction

HFA: Hyogo Framework for Action 2005 – 2015 Building the Resilience for Nations and Communities to Disasters

ONEMI: National Office of Emergency of the Ministry of the Interior (Oficina Nacional de Emergencia del Ministerio del Interior)

Sendai Framework: Sendai Framework for Disaster Risk Reduction 2015-2030

SERNAGEOMIN: National Geology and Mining Service (Servicio Nacional de Geología y Minería)

SNPC: National Civil Protection System (Sistema Nacional de Protección Civil)

I. INTRODUCTION

Chile has a long history of disasters triggered by a wide variety of natural hazards, including earthquakes, tsunamis, floods, droughts, forest fires, volcanic eruptions, among others. In fact, the country is highly exposed to natural hazards, with 54% of the population and 12.9% of the surface exposed to three or more of these threats (Dilley *et al.*, 2005). Its location in the Pacific Ring of Fire, makes the country one of the most prone to eruptions and earthquakes worldwide (CNID, 2016). Thus, earthquakes and tsunamis have been historically the most important events in terms of affected population, deaths and economic losses (DG ECHO, UNESCO, PNUD, Cruz Roja, 2012). Chile has been hit by the strongest earthquake ever recorded in the world, the 1960 Valdivia earthquake and tsunami rating 9.5 M_w, and more recently, by the 2010 Maule earthquake and tsunami, rating of 8.8 M_w, considered the sixth largest earthquake globally (USGS, 2019). The latter resulted in the death of more than 500 people, impacted an area that is home of 75% of Chileans, and caused estimated economic losses of US$ 30 billion (Gobierno de Chile, 2010). In terms of volcanism, Chile has the second highest amount of volcanoes globally, with more than 2000, where 91 are considered geologically active, including Villarrica and Llaima, the two most active in South America (ONEMI, 2016b). Regarding climate change, the country is considered highly vulnerable since it meets seven of the nine criteria that define a country under this category (Ministerio del Medio Ambiente, 2017), being currently high the protracted and widespread so-called Mega Drought that affects central Chile since 2010 (Garreaud *et al.*, 2019).

This context has made the existence of a regulatory and institutional framework[1] an ineludible issue that, as in other countries, has evolved and improved after strong disasters (DG ECHO, UNESCO, PNUD, Cruz Roja, 2012), being the 2010 earthquake and tsunami a turning point at this respect (ONEMI, 2016a), given its impact and the deficiencies revealed in the DRM system. The current DRM National Policy and Strategic Plan, oriented by international agenda and national experience, highlights the participation and the distribution of responsibilities within administrative levels and among stakeholders[2], being both highly related to the construction and

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[1] For a synthesis of the Chilean DRR/M framework see Annex 1.

[2] Despite this, according to the National Civil Protection System, which is the base of the risk management model, the duty of protecting the population still relies on the State.

socialization of knowledge and information with people and communities. Similarly, the National Strategy for Research, Development and Innovation for a Chile Resilient against Disasters of Natural Origin, encourages stakeholders participation and considers that achieving a greater resilience implies consideration of people's interest, knowledge and skills to cope with threats at individual and community levels (CNID, 2016). Overall, the above highlights the relevance of understanding the dynamics of knowledge that allow people and communities to deal with risks and disasters, when it comes to increasing resilience.

In fact, community resilience to deal with natural hazards is shaped by networked adaptative capacities (Norris *et al.*, 2008), where local knowledge can be crucial (Dekens, 2007), particularly as a primary coping mechanism. In Chile, for instance, the 2010 earthquake and tsunami revealed that local knowledge was a relevant resilient capacity that helped coastal communities cope with it (Marín *et al.*, 2010; Moreno, Lara and Torres, 2019) –despite the failed tsunami alarm– working also as a catalyst for other resilient capacities such as cooperation, organization, social capital, and trust, during the immediate emergency period (Moreno, Lara and Torres, 2019). This knowledge showed to be highly related to memory of past disasters.

Actually, memory can be understood as a resource for local knowledge related to disasters (Dekens, 2007; McEwen *et al.*, 2017; Moreno, Lara and Torres, 2019), which has also been linked to social capital (McEwen *et al.*, 2017) and therapeutic issues (Espinoza, Osorio-Parraguez and Reyes, 2016), and whose consideration is relevant for disaster-related regulation (Lakhani and de Smalen, 2018). Different initiatives that directly or indirectly foster remembering have been articulated, illustrating its potentiality for resilience. For example, in Japan, different memorials related to disasters have been implemented, with diverse social functions such as education, information, spirituality and recreation (Cortés *et al.*, 2018); also, in the context of 2007 floods in UK, a ´flood friend´ model was set up[3] (McEwen *et al.*, 2017). However, memory in the context of disasters, as in other realms, has shown to be complex, subject of forgetting, selective, unevenly distributed, dependent on who remembers and from which position, and in many times a

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[3] Flood friend: a trusted confident offering emotional assistance in the course of floods and recovery (McEwen *et al.*, 2017).

contested matter (e.g. Duine, 2015; Baez Ullberg, 2017; Mcewen *et al.*, 2017; Xu, 2018). So, despite their potentiality, neither memory nor local knowledge are a straightforward way to community resilience.

Importantly, for people exposed to natural hazards, that is half of the Chilean population, and particularly those disconnected from local memory and knowledge systems, such as for people from regions with different risks (Marín *et al.*, 2010; Torres Méndez *et al.*, 2018), it may be difficult to cope with hazards if there are not measures to counteract those. Moreover, the time recurrence of giant megathrust earthquakes like the 1960 and 2010 ($M_w > 8.5$), that is longer than 300 years, and large earthquakes (M_w 8.0), between 80-100 years (Ruiz and Madariaga, 2018), illustrates how challenging the permanence of memory can be. Aware of this issue, in recent years, different voices from civil society and academia have been advocating for a greater consideration of memory in disasters realm, revealing the scarcity of related initiatives, and placing value on civil society and local efforts (Díaz-Rubio, 2018; Mora and Orellana, 2018; Bacigalupe, 2019). So far, considering memory - local knowledge relations and complexities is relevant if it is about fostering community resilience, particularly in a country highly prone to disasters triggered by natural hazards as Chile.

But despite the relevance of memory in the realm of disasters, and the calls for more academic investigation (McEwen *et al.*, 2017), the research is still scarce. Thus, in the field of memory studies, wars and political violence are predominant, whereas those related to disasters are significantly fewer (Xu, 2018). In turn, in the multidisciplinary field of disaster studies, the role of memory have been addressed mainly from a psychological view; however, resilience theory has addressed memory in a more systematic way (Ullberg, 2013). In addition, in Chile, social sciences related to disasters of natural origin are still emergent in DRM debate (Romero A., 2015) and research (Romero T. and Romero A., 2015). This work attempts to contribute to these issues by exploring the experience of disaster memory initiatives, headed by civil society or local governments, under a perspective of memory as a practice-process that can contribute to local knowledge for community resilience. This research is Chile-specific, it relies on different social sciences and qualitative methods, and it is oriented by a DRR/M and resilience perspective.

My interest in this area developed during the 2014 – 2016 period, while I worked in an interdisciplinary project related to local and scientific knowledge about atmospheric phenomena in Chile. I am concerned about addressing the complexity and uncertainty of disasters through integration of different kinds of knowledge, while placing value on people experiences.

II. RESEARCH QUESTION AND OBJECTIVES

2.1 Research question

What are the main experiences of disaster memory initiatives carried out by civil society and local governments in Chile?

2.2 Main objective

To explore the experiences of disaster memory initiatives carried out by civil society and local governments in Chile.

2.3 Specific objectives

- To examine the strategies that aid disaster memory initiatives.
- To identify the main challenges to develop the disaster memory initiatives and reach their purposes.

III. LITERATURE REVIEW AND THEORETICAL AND CONCEPTUAL FRAMEWORK

The theoretical and conceptual framework is presented in three sections: social dimension of disasters, local knowledge and memory, and finally, disaster memory as a practice.

3.1 Disasters and their social dimension

Understanding why a disaster happens implies to conceive them not just as a natural event but also as the result of social, political and economic conditions (Wisner *et al.*, 2004). In this study a disaster is understood as "a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts" (UNISDR, 2019). Particularly, this research focuses on disasters triggered by natural hazards.

The concept of "social construction" associated to risks, an analytical tool highly used by disaster experts, considers two main approaches: risk perception and vulnerability (García Acosta, 2005). The concept of risk perception was developed in France since 1980s and implies that people perceive the risk under cultural lens, that is, risk perception is a social and a cultural construction (García Acosta, 2005). On the other hand, the vulnerability approach started in the 1970s and early 1980s with a criticism and a review to the idea that disasters are the result of external natural and 'normal' events (Wisner *et al.*, 2004). Under this perspective, Wisner *et al.* (2004) developed the Pressure and Released model (PAR model) where vulnerability is understood as a progression of root causes, dynamic pressures and unsafe conditions; a disaster is, thus, the intersection of this progression with a natural hazard event. The prominent root causes are economic, demographic and political processes that reflect the distribution of power in society, leading to inequal life conditions and vulnerability (Wisner *et al.*, 2004).

The different, but complementary approaches mentioned above, lead us to resilience, which unlike vulnerability, tries to explore adaptation to change focusing on people's strengths (Dekens, 2007). With origins in the sciences of physics and mathematics, and non-exempt of criticism (Norris *et al.*, 2008), the concept has received ample recognition in the field of disaster management with the adoption of Hyogo Framework for Action (HFA) 2005-2015 (UN, 2015), and ultimately with The Sendai Framework for Disaster Risk Reduction 2015-2030, the successor of HFA (UNISDR, 2015). Thus, resilience can be conceived as "the capacities of a system, a person, a community or a country exposed to a hazard of natural origin, to anticipate, resist, absorb, adapt to and recover from its effects in a timely and efficient manner, to achieve the preservation, restauration and improvement of its structures, basic functions and identity" (CNID, 2016, p. 4).

Resilience at community level is relevant because disasters are local events that first and principally affect local communities, so local people are the ones affected and the first responders (Delica-willison and Gaillard, 2012). Particularly, community resilience is a "process linking a network of adaptative capacities (resources with dynamics attributes) to adaptation after a disturbance or adversity" (Norris *et al.*, 2008, p. 127), within which context the relevance of collective action has been highlighted. The mentioned capacities become adaptative capacities when they are robust, redundant or rapidly accessible and, consequently, can counterbalance a

new stressor, danger or surprise (Norris *et al.*, 2008). Different frameworks and systematizations have been developed, suggesting a variety of capacities, resources and characteristics for resilience at community level (e.g. Norris *et al.*, 2008; Kwok *et al.*, 2016). In Chile, for instance, Moreno, Lara and Torres (2019) underlined sense of community, local knowledge, social capital, organization, cooperation and trust, as key capacities in the survival of El Morro fishing community after 2010 earthquake and tsunami. The capacities are displayed differently across the disaster cycle, as they can play different roles and are demanded with varied urgency (Kwok *et al.*, 2016).

Overall, this section highlights the social dimension of disasters, and community resilience is emphasized as a process linking a network of adaptative capacities or resources. It is suggested that, to address disaster risk, it is relevant to address the vulnerability and the adaptative capacities that allow communities to cope with disasters. The following section focuses on this latter issue, particularly in local knowledge and disaster memory.

3.2 Local knowledge and memory in the context of disasters

What people know, believe and do about natural hazard risks in a given situation is what it is referred as local knowledge in this study; it is dynamic, complex, and related to environmental linkages built over time (Dekens, 2007). It includes subjective narratives developed to understand, explain and assign meaning to events in everyday life (McEwen *et al.*, 2017). Stories, songs and similar are not just helpful to remember past events, but also to communicate messages attractively and convincingly, turning abstract events into something more tangible (Dekens, 2007). The terminology regarding local knowledge is diverse[4]; however, here it is considered in its broadest sense. Although evidence has highlighted its potentiality since the early 1970, local knowledge has been, until recently, relegated from mainstream disaster literature and institutions charge of disaster management (Dekens, 2007). Currently, Sendai Framework (UNISDR, 2015), and the Chilean national DRM Policy (ONEMI, 2016b) recognize the relevance of local knowledge.

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[4] It includes 'indigenous knowledge', 'traditional knowledge', 'folk knowledge', 'folk science', 'citizen science' (Dekens, 2007), 'lay knowledge' (McEwen *et al.*, 2017), among others.

Local knowledge and practices, combined with conventional knowledge, and ultimately situated in the context of sustainable development, livelihood security and community resilience, can potentially contribute to DRR (Dekens, 2007). The cases reported by Marín *et al.* (2010) and Moreno, Lara and Torres (2019), in the context of Chile 2010 earthquake and tsunami, regarding coping strategies deployed by small-scale fishing communities in spite of the failure of tsunami warning, support the relevance that local knowledge can have in disastrous scenarios; and what is more, this event showed that local knowledge, together with social capital, can be a catalyst for other resilient capacities (Moreno, Lara and Torres, 2019). Local knowledge can be related to diverse topics, including social, environmental and local risk issues (e.g. Marín *et al.*, 2010; Kronmüller *et al.*, 2017; Aldunce Ide, Mena Maldonado and Lillo Ortega, 2018; Torres Méndez *et al.*, 2018; Moreno, Lara and Torres, 2019). Furthermore, local knowledge can be an entry point for people´s participation and can orient communication tools for DRM (Dekens, 2007). Importantly, local knowledge may not be correctly framed for resilience actions, and also, it can be involved in power relations and contested matters; despite this complexities, it always needs to be considered (Dekens, 2007).

Importantly, memory has shown to be highly related to local knowledge. In fact, Dekens (2007) notes that rather than from the intellect, local knowledge derives mainly from memory, intuition and the senses, and it is always a mixture of experiential and transmitted knowledge, where the latter is intergenerational and culturally internalized. McEwen *et al.* (2017) highlight personal and collective memories as important elements of individual and social capital, and in local knowledge; as such, they are relevant in connecting individual and collective ´capacities for resilience'. Studies conducted in Chilean communities in the context of 2010 earthquake and tsunami showed that a strong collective memory of past events was part of the local knowledge that contributed to people's survival (Moreno, Lara and Torres, 2019). Torres Méndez *et al.* (2018), in turn, considered collective memory as an adaptative capacity that facilitates learning and knowledge transmission.

Going more deeply into memory, contemporary usages of it are usually traced to Maurice Halbwachs, who defined collective memory[5] as the active past that forms our identities (Olick and Robbins, 1998). Memory is "the principal mechanism that mediates past experiences with present understandings and anticipatory actions" (Báez Ullberg, 2018, p. 79), which currently is recognized as an individual and a social phenomenon; a situated, heterogeneous and dynamic process that is built in the past and in the present. Memory is relevant in the context of disasters. After a disaster, processes of meaning-making are developed, leading to cultural and political signification of the event (Báez Ullberg, 2018), which influences present and future actions, resulting in different DRR/M strategies.

Besides its connection with local knowledge and social learning, the emotional dimension of memory is also relevant, influencing the development of local knowledge, behavioural responses and decision-making, and efforts to co-manage these in and with communities (McEwen *et al.*, 2017). Something closely related is the healing and therapeutic potential of memory. This was evident in the intervention with elderly in rural areas, conducted by Espinoza, Osorio-Parraguez and Reyes (2016), after the 2010 earthquake and tsunami; here art therapy strategies, guided by collective memory materialized trough narratives, were reported as therapeutic and healing for the participants, highlighting concomitant processes of knowledge production and psychosocial recovery. Post-disaster rituals of remembering can potentially contribute to reestablish feelings of control, belonging, and social solidarity within a community; also, ritual and collective expression following death are relevant to effectively grieving and recovery (Eyre, 2007).

Actors expressed and materialized memory in many ways, including knowledge translated into practices and regulations (Witze, 2015); public governmental infrastructure (Baez Ullberg, 2017); sites of memory representing affected population (Baez Ullberg, 2017); official commemorations, topographical changes, artistic objects and documentaries (Xu, 2018); digital memory banks (Recuber, 2012); museums (Cortés *et al.*, 2018); geographical elements, landscape and its reconfiguration, myths (Kronmüller *et al.*, 2017), among others.

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[5] Some authors, instead of "collective memory", use "social memory" or "cultural memory" (see Olick and Robbins (1998) for a more comprehensive review).

But whereas remembering is high in social memory, forgetting also plays a relevant role. What is being remembered and/or forgotten in societies depends on who remembers and from which social position this remembrance occurs at a specific time; and what is more, public remembering easily turns into contested issues and politics of memory (Báez Ullberg, 2018). An example of the latter issue is the case of 2008 Sichuan earthquake in China, where the tensions between natural and unnatural views configured the commemorations headed by the state and oppositional groups, respectively (Xu, 2018); also, the 2003 Santa Fe flood in Argentina, where memory of floods developed in a highly politicized and judicialized scenario, in a context of vulnerability (Báez Ullberg, 2018). An unavoidable point of reference in Chile, although not related to memory in the context of disasters, is memory regarding the military dictatorship period (1973-1990).

Now, in terms of memory and disaster-related policies and regulations, Lakhani and de Smalen, (2018) propose three recommendations. Firstly, to acknowledge and incorporate not just dominant narratives but also, and importantly, counternarratives in policymaking. Secondly, it is suggested considering citizens' memories as a vital source of knowledge for disaster management, which is not available through other institutionalized sources; recognizing memory is relevant in terms of innovation and legitimization of people's experiences. Finally, to acknowledge the role of remembering and forgetting is crucial to support resilience in communities; understanding the complexities of both processes and being aware of their implications in terms of DRR strategies.

In sum, this section characterized local knowledge in the context of adaptative capacities for resilience. Here, memory is considered a relevant resource for local knowledge, which is also related to social connectedness and healing. Both, local knowledge and memory, are dynamic and complex mechanisms that can potentially support communities in dealing with disasters. This highlights the relevance of studying memory practices that can lead to actionable knowledge for resilience, which is reviewed in the following section.

3.3 Disaster memory as a process

Since my participants articulated practices for memory when described their initiatives, I found particularly interesting the conceptual framework of McEwen *et al.* (2017), referred to ´sustainable flood memory´, contextualized in DRM decision-making; this considers building,

organizing and sharing sustainable flood memory as a good practice oriented to local resilience. Relevant issues at this respect are briefly developed below.

Firstly, disaster memory – local knowledge relationships can draw on different mechanisms. Thus, local knowledge can derive from intertwined memory of people´s individual experience and communication, the latter including inter-intragenerational transmission and archival memory (Dekens, 2007; McEwen *et al.*, 2017). An example of this is the study developed in Chile after 2015 Atacama mudflow, where participants declared having acquired local knowledge about the risks from personal experience on similar disasters, from experience of living in the area, from relatives, from neighbors, from people living in the mountain range (such as Colla indigenous people), and from historical registers (Aldunce Ide, Mena Maldonado and Lillo Ortega, 2018). It is relevant to note that memory can be exercised vertically, i.e. between generations through time, and horizontally, i.e. in time and intergenerationally (McEwen *et al.*, 2017). Overall, a key factor for the conversion of memory – knowledge is the effectiveness and persistence of the connectors and connections between them, which can result in processes of remembering and/or forgetting (McEwen *et al.*, 2017).

Importantly, memories need to be stored and accessible to effectively become local knowledge that contributes to resilience. Here it is relevant to evaluate if memory is being archived, where the archives are, and who are the gatekeepers. Additionally, establishing disaster memory for resilience requires processes of sharing and reflection, where rehearsal, translation and potentially reconstruction of archived memory into practice for future action are relevant (McEwen *et al.*, 2017). This is consistent with the conceptualization of local knowledge on disaster preparedness of Dekens (2007), who considers it is based on, not just people´s experience and communication, but also on anticipation (recognize and monitor environment indicators), and adaptation (access to assets and ability to learn, self-organize, etc.).

Finally, as it has been noticed, memory – local knowledge relationships are complex, unpredictable, and mediated by processes of forgetting and remembering. The interplay of these processes can be very sensitive, contested and matter of local negotiation; additionally, memory is dynamic and irregularly distributed, and local knowledge may not necessarily be positively framed

to increase resilience (McEwen *et al.*, 2017). This reinforces the relevance of reflective processes, the integration of different types of knowledge, and the recognition that community resilience is not about isolated adaptive capacities, but a dynamic network of these.

In view of all that has been mentioned so far, disaster memory as a practice and process can be situated in the context of developing local knowledge as an adaptative capacity for community resilience, having also potential to reinforce other resilience resources such as connectedness and psychosocial resilience and healing. The exploration and discussion of the Chilean initiatives will fall under this framework.

IV. METHODOLOGY

This work is a qualitative research project, particularly an exploratory case study, since the contextual conditions are considered relevant to the phenomena under study (Baxter and Jack, 2008).

4.1 Study location and participants

The study location is Chile, a country located in the extreme south-west of South America, which capital city is Santiago. With a 17.5 million population, 40% of Chileans live in Región Metropolitana (INE-Chile, 2018), revealing a highly concentration in central regions, consistent with a high political and administrative centralism, also reflected in the DRM system (Lacambra *et al.*, 2015). The economy is mainly based on natural resources exploitation and exports. Chile is considered a high-income country (The Wold Bank, 2019), nevertheless, it faces a high inequality that, during the thesis writing period, gave rise to social riots profusely documented in media and social media. Turning now to the participants, they are civil society or local government initiatives, developed in Chile, which commemorate and/or place value on disaster memory, from cultural-patrimonial and/or DRR/M perspectives.

4.2 Data collection

Case study research relies on multiple methods and sources of information that allow a comprehensive investigation (Skovdal and Cornish, 2015). Thus, the work was based mostly on semi-structured interviews, but also documentary sources and conversations with key actors were

considered. The data collection was oriented by a previous literature review, after which, and complementarily, two processes were developed: involvement in the realm and conducting interviews.

The **involvement in the realm** included conversations with Chilean researchers, disaster memory initiatives coordinators, and the attendance to a seminar where representatives of two memory initiatives participated. The researchers and the initiative coordinators were firstly contacted based on the literature review and a search of initiatives conducted through internet; and secondly, by the references obtained as a result of the conversations. Additionally, conversations by chance took place with a firefighter and a parking lot attendant in a site of memory. The conversations, 13 in total, were conducted either face to face or by telephone, during March and April 2019. The information gathered through this process was recorded trough handwritten notes taken during or after the encounters. The outcomes of this process were:

- Verification of civil society and local government disaster memory initiatives and identification of new ones.
- Identification of new literature.
- Identification of relevant topics.

Regarding **in-depth interviews**, these are the most common qualitative data collection method, and are generally used to investigate people´s perceptions (Skovdal and Cornish, 2015). Thus, individual semi-structured interviews were conducted to examine people's experiences regarding disaster memory initiatives. The **inclusion criteria** were to be a current organized initiative, developed in Chile, that commemorated and/or placed value on disaster memory, with people in charge available to be interviewed during the interview period. The participants were selected purposefully trough *'snowball' effect* strategy (Skovdal and Cornish, 2015); that is, the researchers and initiatives coordinators were asked by the researcher (N.F.) to give recommendations of potential participants who fitted the inclusion criteria. During the interviews the initiative coordinators were asked again in order to check and/or identify other initiatives that had not been mentioned before.

In total, 13 initiatives that potentially met the inclusion criteria were well identified. From this group, eight initiatives were formally invited to participate, the rest were not invited because they could not be contacted (three cases) or were found at the end of the interview period (two cases). Finally, seven interviews were effectively carried out between May and June 2019, five to civil society and two to local governments initiatives; with starting years ranging from 2010 to 2018. The participants were people in charge of the initiatives, with three female and four male participants ranging in age from 30 to 49 years; all with higher studies; and living in Región Metropolitana, Región de Ñuble and Región del Biobío. Most of the interviewees recognize themselves and the initiatives in the realm of cultural and patrimonial management and/or history, and some of them in the realm of DRM.

The interviews lasted between 60 and 105 minutes, and were conducted in Spanish, one to one, through Skype and Google Meet (six video calls, and one call), by the female researcher (N.F.), who had about one year of previous qualitative research experience, being the most comprehensive experience a one-month course that took place in February 2019[6]. A referential semi-structured interview guide was used during all the interviews (Annex 2), which was build based on the literature review and the previous conversations with researchers and initiatives coordinators. The data was audio-recorded, and, additionally, handwritten notes were taken. The interviews were transcribed as simple transcriptions, were the content more than the nonverbal elements was a priority (Dresing, Pehl and Schmieder, 2015), by the researcher (N.F.) and a support person, using the software f4transkript and FTW Transcriber, and transcription rules to maintain coherence. In all the cases, the interviews represented a second encounter with the participants since previous conversations, face to face or by telephone, were carried out not just to check and get information, but also to get a better rapport with the interviewees (Baxter and Jack, 2008).

The outcomes of this process were:

- Audio records
- Interview transcriptions
- Observations/reflections

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[6] "Vulnerability and Risk Assessment" course, taken as part of the present Master program.

The raw data and sources of information were stored and organized, so these could be available for independent examination (Baxter and Jack, 2008).

4.3 Data analysis

The analysis went on the single case of Chile and the multiple cases of disaster memory initiatives. The interviews transcriptions and observations were analyzed under thematic analysis (TA), which is a common strategy to analyze qualitative data (Skovdal and Cornish, 2015), and it is a method focused on the identification, analysis and presentation of data patterns (Braun and Clarke, 2006). As the initiatives under study are part of what seems to be an emergent concern in the country, the analysis considered a description of the entire data set, to get a sense of the relevant themes in terms of the conceptual and theorical framework; and was conducted under an inductive, semantic and essentialist/realist approach (Braun and Clarke, 2006). The analysis was supported by the software ATLAS.TI, and it was developed through six phases proposed by Braun and Clarke (2006):

- Familiarizing with the data

- Generating initial codes

- Searching themes

- Defining and naming themes

- Producing the report

The analytical gaze focused on people's views and experiences when carrying out the initiatives, paying attention to internal and contextual factors and processes that could be relevant in terms of memory practices for community resilience. Thus, the interviews were coded according what seems significant in terms of the research question and the conceptual approach; at the same time, the research question and the approach evolved through the coding process in order to address the emerging nature of the data.

The prevalence in this study is considered at level of data item, meaning that any theme identified anywhere in each individual interview is considered while it contributes to the research question. However, the cases where most of the interviewees (≥ 4) or just a single participant articulate a specific theme, are emphasized.

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Keeping research notes, fieldnotes during and after the interviews, and developing reflections throughout the research were strategies used to enhance the study quality (Baxter and Jack, 2008).

4.4 Bias and ethical considerations

Bias: I consider that the integration of different perspectives and types of knowledge are positive elements to DRR/M strategies, so I consider that the initiatives could be an interesting step in progressing in this issue in the national DRR/M framework. In order to prevent bias resulting from the above, conversations with different researchers and people involve in the initiatives were developed, and different kinds of initiatives were addressed, to avoid seeing them as a whole and catch some nuances.

Ethics: Interviews considered the principles of do no harm, ensuring transparency, voluntary participation and feedback. It included: written informed consent (Annex 3); confidentiality and secure data storage; de-identification of interview audio records, notes and transcriptions; written confidentiality agreement with transcription support person (Annex 4). The informed consent was developed based on orientations given by Ethical Committees of Research of the Faculty of Social Science (Universidad de Chile, 2019a) and the Faculty of Philosophy and Humanities of the University of Chile (Universidad de Chile, 2019b).

4.5 Limitations of the study

Firstly, the limited number of interviews does not allow the generalization of study results, so it is relevant to emphasize the exploratory nature of the research. Secondly, perspectives from other actors, such as disaster managers and community members, as well as field observations of the initiatives, that could have given interesting insights, were not considered in this research. Clearly, it could be part of a next step in the research. Thirdly, communicational restrictions constituted a limitation in terms of observation of the context and nonverbal language; sound and image issues were particularly challenging in one case, although they did not impede me from conducting the interview. Finally, I am aware of my short trajectory in qualitative methods; therefore, methodological documents and videos were continuously consulted, and conversations with people with more experience were conducted, to overcome this situation.

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V. FINDINGS

The findings below are organized around two themes: Strategies, and Tensions and Challenges.

5.1 Strategies

Orientation of the initiatives

In all the cases, the initiatives are framed within the cultural sphere, revealing an understanding of social groups temporally and spatially contextualized and/or identified by natural risks and/or disasters. Thus, terms such as patrimony, culture, identity, history, memory or processes of remembering, earthquakes, eruptions, floods, risks, and disasters, under territorial perspectives, are commonly articulated. What is more, disaster risks are part of the narratives of the participants when they referred themselves as inhabitants or when describing the territory. Three of the participants exhibited a more DRM-oriented terminology, where concepts such as risk management, resilience, vulnerability, prevention culture, are used to explain what they do. Also, elements of urbanism, such as churches and houses, are highlighted as urban remembrances of disasters.

> "I think disaster memory is a mixture of all these things we are trying to rescue at the museum, which are geography, emergency, and the social aspect, and human spirit, and what I believe is valuable, and what I want, and being rooted, and human relationships, it is very broad" (Participant 3)

The motivations to deploy the initiatives are varied and revolved around three main issues, generally intertwined. Firstly, a personal interest, feeling called to or the desire to do or to foster something (e.g. interest in patrimony, memory, identity, and disasters as part of the national identity; desire to preserve the memory of a particular event; highlighting community strength related to a controversial governmental evacuation; feeling called to contribute from organized civil society to promote changes; acknowledgment of the relevance of tangible elements in public space to preserve memory). Secondly, the perception that there is a lack of something (e.g. lack of disaster memory initiatives; lack of regional research about disasters; lack of regional knowledge about risks; perception of lack of people involvement related to desire to forget and go forward). And thirdly, as a criticism (e.g. overarching discourses that disregard local perspectives, centralized production of knowledge, gaps evidenced in risk management system). Importantly, 2010 earthquake and tsunami is mentioned as a relevant lived experience for two participants, and as the initiative trigger for three participants.

"It was born from a doubt, from a very personal question I had related to the awareness of a gap in disaster memory. On the other hand, it arose from a personal motivation when thinking how could I link or work on two topics that (inc.)[7] very much, which was, on the one hand, everything related to heritage, memory, and identity, that were linked on a way to my personal interests, and also to my previous academic background or profile, and disaster theme seen from a kind of more anthropological point of view" (Participant 1)

Most of the initiatives are oriented to educative, reflective and informative purposes. Under this context, diverse or complementary orientations are highlighted, including a perspective of past and future of the city, healing processes, boosting economic growth, increasing disaster prevention and awareness, advocating for legal changes in territorial plans, promoting risk consciousness and acting upon them.

"Not only as "Ok, remember that a certain day there was this", but rather that remembering has a meaning, a reflective meaning, an educative meaning, a meaning of taking action leading to change. That's why I talk about active memory" (Participant 5)

Deployment of the initiatives

Now, how do the initiatives look like? In brief, these include an online communicational platform with information of different disasters; a municipality-led commemoration that comprises performative activities, exhibitions and academic workshops; a museum that conserves *in situ* damaged infrastructure, including an interpretation center that is in building process; a historical research, part of a one-year project, which includes workshops and the elaboration and distribution of a book with the research´s results; a survivors DRM-oriented organization, where memory is part of the working axis, which include commemoration, photo exhibitions, rescue of patrimonial debris, and placing value on memory in the context of technical working groups; an organization that has articulated different projects related to education and memory, including commemorations, memory alerts, oral tradition rescue, working also in other issues such as advocacy; a municipality-led DRM unit, where memory has been integrated as part of the working axis, including photo and testimony exhibitions, a publication, and a museum in planning phase.

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[7] Unintelligible word.

So, the initiatives are diverse, and the deployment told by the participants can be seen from several perspectives. In terms of spatiality, the initiatives are thought from national to regional or communal scales. Interestedly, one initiative deployed physically at communal level considers itself as a national initiative given its uniqueness; and most of the initiatives have had an emerging participation in initiatives deployed at scales different to their initial orientation. In terms of materiality, virtual and physical oriented deployment can be distinguished; thus, although the use of social media is a transversal feature (in different degrees), in the case of the online platform it is key to the existence and shaping of the online community.

> [in reference to social media] "If those media didn't exist, it'd be much more difficult to build the community, which, in my opinion, makes for half of the work, I mean, fifty per cent is what I do together with my workmates, we create content or share content or we select it and provide a kind of editorial look about the content, but the other half is made by the people who share, ask, give likes, comment, tell their story, and without this technology that part wouldn't exist" (Participant 1)

In terms of temporality, continuous and punctual initiatives can be distinguished, the latter developed as a regular pattern, such as a commemoration, or a specific project. The continuous ones can include commemorations or specific projects, but what makes them continuous is the fact that they are articulated with other actions developed during the year, for example articulation of online commemorations trough sharing content, with activities in the field. In addition, single-disaster and multi disasters-oriented initiatives can be recognized.

> [in] "social media, the disaster will always be commemorated from the one in Arica to the 1946 earthquake in Punta Arenas […] but we choose certain places where we go to the territory, we speak to social organizations, to local government, em, clearly because it's important due to the magnitude of the earthquake that hit, but there are also cases where eh, the sector is more vulnerable" (Participant 6)

It is interesting to mention that most of the participants also refer to emotive and/or therapeutical issues, and those involved in activities such as commemorations and museums suggest narrative structures when describing the initiatives characteristics.

> "the sensitive dimension, right?, it's necessary to work on it, get it?, because you really connect with the most inherent part of human being, which it's certainly not the brain, right? Brain plays tricks on us, it makes us forget that we can be moved" (Participant 2)

The participants exhibit processes of searching and changing, and in some cases, it is possible to observe mechanisms that orient decision-making. Thus, looking for initiative's improvements, for new perspectives to understand disasters, for new symbols and activities for commemorations, for local and temporal pertinence to conduct workshops, for developing or positioning new concepts (e.g. 'seismic memory', 'active memory', 'archive culture') are examples of processes articulated. Mechanisms and factors that contribute to decision-making may include editorial view, public response in social media, expressions of community gratitude, observation of people reactions, feedback from people and other organizations.

> [referring to a photo exhibition] "Then we would go in a way to listen to what attending people were saying, anonymously […] Then you noticed that their conversation allowed a positive reflection in the sense of being able to share experiences, healing wounds, and also remembering preparation and prevention" (Participant 7)

Actors and Networks

The interviews show that there are two types of organizational structures. In the first group, the initiatives, just headed by civil society, rely on one person that is usually helped by one or more, regular or irregular, collaborators. Interestedly, for the online platform, the role of the online community is highlighted not just in terms of audience but as a pool of potential collaborators. In the second group, consisting of civil society and local government initiatives, the initiatives rely on teams of two or more people of direct collaborators. In general, the latter exhibit a longer time of operation and a more consolidated stakeholders' network than the first group. Regardless the groups, lack of time and collaborators has shown to be challenging, which is further developed below.

Regarding links with other organizations, it is relevant to distinguish that five of the initiatives recognize different kinds of alliances with stakeholders; from the rest, one of the participants, although he does not remark networks, he distinguishes linkages when describing the deployment of the initiative. Thus, stakeholders include organizations of the Government Administration and municipalities, including a technical working group and the National Library, Archive and a museum; academic institutions and centers; and other types of organizations such as civil society organizations, churches, firefighters, schools, artists, media and companies. In some cases, the stakeholders include international organizations. From the DRM realm, firefighters are highlighted

in most of the cases, where they are related to information provision and participation in commemorative events; ONEMI is mentioned as a partner by some initiatives, and SERNAGEOMIN is underlined in one case as the most relevant governmental organization linked to the initiative. Despite this, two initiatives, are described as more involved in the DRM and National Civil Protection System, one from municipality and other from organized civil society. Municipalities are relevant for most of the participants, but not always in relation to the DRM area. Media is recognized as relevant by some initiatives having varied roles depending on the case, including covering previous period and real time commemorations deployment, serving as an educational support, and making visible and contributing to legitimize the initiative. In one case, local radio is highlighted as a relevant partner, which also played a relevant role during the 2010 earthquake and tsunami.

> "and, so far, no, I haven't been able to focus on doing that kind of networking task, and I think it's important" (Participant 1)

> "We are a linked organization. That's to say, it is connected to the varied organizations and institutions that take part in the National Civil Protection System, we partner with authority, we partner with technical bodies, such as ONEMI, the academia, eh, CONAF, firefighters, these are technical bodies, and we also link with civil society" (Participant 5)

Turning now to economic resources, most of the interviewees use/have used competitive governmental funds; other sources, which complement or are used as unique source, include personal investment, municipal resources and companies support. Competitive funds associated to the culture realm, such as those provided by the Ministry of Culture, Arts and Heritage, are perceived by most of the interviewees as an effective or potential option for the initiatives. Importantly, most of the participants emphasized the idea of willingness, meaning that the initiatives are executed mainly supported by the conviction of the people and/or organizations involved (it depends on the initiative), rather than by the availability of economic resources.

> "Then, it's always related to willingness, to our time availability" (Participant 6)

> "What we do is to activate people will, we're specialists in that" (Participant 2)

In terms of audiences or target groups, the initiatives are oriented to general public, with some nuances. For the initiative consisting of an online platform, the community involved, which was

not planned but developed through time, comprises 20-35 years people, interested in history, memory, sciences, social geography, architecture, patrimony and churches. Other participant highlights the audience in terms of family and generations, and their related processes of memory transmission; other interviewee adds that over time, the initiative has included tourist as part of the audience. Finally, other participant, beside community, mentions students and highlight decision-makers as expected audience.

The initiatives vary, and so do the types of community participation described. A first distinction is the material mean of participation, which can be online, basically trough social media, or in person. Although all the initiatives include social media, online participation is mainly emphasized by three initiatives, of which in one case it is the last way. Depending on the case, the types of participation ranges from the possibility to become a direct collaborator trough developing content or activities, as a person or organization; commenting and sharing information through social media; being involve in public or particular activities (cycling event, collective silence, psychosocial intervention whose results feed the initiative, informal conversations during planning phase, working groups were civil society is involved); and accessing information or knowledge (workshops, talks, testimonies as part of commemorations or exhibitions, newspaper covers and photos exhibitions, publications). Interestedly, the experiences of some interviewees give an idea of audiences as relevant co-builders of the initiatives.

> "we've been focusing on school work and community trainings, and there you can view certain topics or notice certain concerns" (Participant 7)

> "Interventions, as you already got it, are made with the people, I mean that even if I really want to make bikes sound, I couldn't have done it with one thousand two hundred by myself, got it?, it's the people who build interventions" (Participant 2)

Disaster's Knowledge and Information Used in the Initiatives

In order to deploy the initiatives, and sometimes as part of the initiatives themselves, the participants rely on three main types of information and knowledge: expert knowledge, local knowledge, and media or other type of information. The first one includes information related to social sciences, meteorology, seismology, volcanology, climatic change, technical and institutional knowledge associated to DRM organizations; this is accessed via scientists and technician's

contribution (e.g. firefighters, SERNAGEOMIN, ONEMI), academic workshops organized as part of the initiatives, interviewees attendance to seminars, participation in technical working groups, papers. Local knowledge includes people's stories and experiences (elderly, survivors), interviewee's experiences as survivors, photos, written comments, life-journals; this is accessed through social media, interviews, staff experience and participative activities. The third one includes newspapers, tapes, photos, chronicles, decrees; this is accessed through media companies, Chilean National Library, National Museum of History, National Archive of Chile. Interestedly, all the organizations integrate all the types of information mentioned above, and some participants perceive that there is a relevant amount of documental information regarding disasters.

> "a differentiating aspect of this research[8] is that we have had to study quite a lot of scientific information, then, papers on meteorology, seismology, volcanoes, eh, themes that aren't exactly our own, but that we need to know so we can manage the language and interpret correctly what we read" (Participant 4)

Here it is relevant to highlight three interesting experiences of an initiative. The first one refers to activate memory of hazards that happened hundreds of years ago, like the 1730 Valparaíso earthquake and tsunami, where historical archives and geosciences are key to foster people and authorities' awareness about these kinds of events. The second one, in planning phase, is related to rescuing oral tradition, through delivering a citizen written archive, about a past earthquake, to the National Archive. The third one, also in planning phase for the next commemoration, considers workshops oriented to, explicitly, a cross-generational meeting between earthquake survivors, that lived the event as children, and children.

Achievements

The perceived achievements revolve around four main topics closely related and diversely manifested depending on the initiative: to have raised people´s and organizations' interest, to have contributed to develop networks around the initiatives, to have placed value on the 'local' sphere, and to have contributed to changes or have impacted on the public sphere. The first one includes a permanent reaction to published posts, increasing number of participants, expression

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[8] In this case, the investigation itself is part of the initiative.

of gratitude, demand for informative talks. The second topic is reflected in the recognition of an online community, a network working in prevention through culture and arts, support from international organizations, funding-oriented linkages, mutually beneficial alliance with touristic companies. The third one is illustrated, for example, by the fact of having placed value on the voice of affected people, to have achieved an exhibition built by the community, and to have led archives to local memory. Finally, the last one revolved around the generation of actions in the public realm from within, credibility achievement from authorities and community while positioning victims' knowledge as relevant, introduction of the national day of disasters in the parliamentary debate, and contribution to positioning the topic of memory in public organizations such as ONEMI.

> "having obtained the funding to build the interpretive center is very important, it took us two years to get it. Having an exhibition generated by the community in place is wonderful" (Participant 3)

> "we have also contributed in that sense, that authorities and community in general understand victims aren't only help recipients in the first stage, but they also become important actors in generating the future changes based on experience" (Participant 5)

> "besides, it's interesting how we have transformed not an explicit network, but there is a kind of actors' network who are working on prevention, through culture and arts" (Participant 6)

5.2 Tensions and Challenges

Centralism

Difficulties regarding centralism are articulated by some participants. Thus, centralism is illustrated by disasters discourses focused on big cities, mostly in Santiago, omitting other perspectives. Centralism may also affect education, obscuring local stories. The location of archives and the production of historical knowledge, both mostly situated in Región Metropolitana, are other issues highlighted by the participants when discussing centralism.

> "sometimes, the catastrophe discourse is too focused on what happened in big cities, em, there is a timeline in Santiago, in Concepción, those are the most important events, which omits other events not apparently on that radar" (Participant 1)

> "it's a good thing that it exists in Santiago, but it doesn't make sense in Santiago, archives make sense in their context" (Participant 2)

Memory in the Context of Disasters: An Emergent Issue

Most of the participants articulate the idea that memory in the context of disaster is not highly regarded yet in the country. Thus, a loophole in disaster memory, scarcity of initiatives, few local governments and institutional initiatives to rescue memory are referred by the interviewees. Also, dismissal of local knowledge during emergencies is highlighted by an interviewee. One participant has observed memory mostly associated to private practices, which would be a response to the excessive manipulation of commemorative events after 2010 earthquake and tsunami, resulting in people reluctancy to television and authorities presence in their memory spaces. Other interviewees argue that what is high in terms of memory in Chile is related to the dictatorship and human rights violations.

However, some interviewees perceive that there is an increasing interest in memory in the disaster' realm. So, they refer the work made by some NGOs and the interest of ONEMI in developing some work oriented to this theme. The turning point of the increasing attention to disaster memory is differently emphasized. Thus, one interviewee considers it is related to the concept of resilience promoted by the international agenda; other participant highlights the 2010 earthquake and tsunami as a milestone where memory gained strength; also, it is thought that ONEMI's interest became stronger after a controversy triggered by opinions of the ex-Minister of Culture against the Museum of Memory and Human Rights in August 2018.

> "after Talca earthquake in 1928 the Law of Urban Development and Construction was created, due to 1939 one CORFO is born, what can I say, in 1906 the Seismological Center was born, and I believe that if one could say what emerged after 2010 that would be memory" (Participant 6)

The interviewees articulate different explanations related to the emergent status of disaster memory. One interviewee argues that while memory has to do with elaborating experiences socially, the national DRM culture is new, so it would be influencing the scarce development of the concept of memory related to disaster. Some interviewees emphasize the lack of political will to support memory initiatives in the context of disasters, resulting, as explained in one interview, in a huge effort of civil society to develop initiatives. Complementary, a participant depicts the DRM as

unrewarded, because even "if you did a good job nothing will happen. Then, the positive impact of management has little visibility, and that impact lowers its prioritization" (Participant 7). Finally, some participants highlight people desire to deny or forget the experience and move forward to avoid suffering.

> "people who go through emergency and disaster situations, eh, in general, tend to, or a community that lives an experience like that one, is prone to wanting to forget the experience, as if forgetting it or denying it was a way to avoid suffering, to pretend it didn't happen, but, in fact, denying the experience only means we also refuse the possibility of learning from the experience" (Participant 5)

Lack of collaborators, funding issues and networks

Most of the participants perceive that the lack of time and/or the excess of roles played simultaneously, associated to lack of direct collaborators and/or parallel compromises, challenge the development of activities. In turn, the lack of collaborators is associated by some interviewees to lack of funding. Related to funding, some participants highlight difficulties when applying for funds, and the time finally involved in getting funding. Additionally, regarding governmental funding, restrictions in expenditure items and difficulties related to administrative aspects, which are also linked to lack of collaborators, are underlined by some participants.

> "to tell you the truth, one has to develop several skills in the project, then besides being a historian one has to be accountant, coordinator, journalist, get it?, lecturer, you have to do it all. Well, maybe in projects with much more funding we will be able to hire someone for each role, but that's what's difficult, eh, to deal with these various areas, simultaneously" (Participant 4)

Additionally, there are some issues related to local governments and networks. In relation to the first one, it is possible to identify that rigid structure, bureaucracy and involvement in daily emergencies, are highlighted by some participants because these impact the municipalities in terms of the execution of innovative activities, the permanent flux of information related to disaster risk issues, and long-term planning. Finally, one participant acknowledges the relevance of networking, but she recognizes that has been unable to work on it.

Contested and political issues

Contested and political issues are articulated by some participants, where different views are at stake. Thus, two topics can be distinguished: different views around the initiative, and overwhelming discourses or actions observed. The first topic is related to minoritarian critical

voices from community members or audiences about the view of remembering as a negative practice associated with suffering; also, in one case, a rivalry with local government is perceived, affecting the development of some activities. The second topic refers to general reflections or observed cases about governmental discourses or institutional practices looking for positioning specific views around disasters, resulting in lack of consideration of different perspectives, oppositional responses and/or disregard of local knowledge. For example, one case referred to the 2010 earthquake and tsunami memorial, built in the city of Concepción, where the dispute is illustrated in terms of lack of governmental connection with a community that was still suffering the effects of the event; here, the memorial was built before finishing the administrative period of that time, generating diverse community rejection actions.

> "it doesn't make any sense to raise a memorial, which is an architectonic work, it's absolutely out of context from Concepción reality, from affected people' experiences, in the middle of reconstruction process, I mean, completely at the wrong time, disconnected from reality, and that is a political effort, rather than an example of memory exercise" (Participant 5)

DISCUSSION

The discussion below is structured in summary and significance of the findings, lessons learned and future research.

The study of Chilean disaster memory initiatives shows the participants' experiences through examining their strategies and identifying the challenges and tensions in reaching their purposes and in fostering disaster memory. The **strategies** reveal that, albeit some of them are more DRM-oriented, the initiatives are fundamentally framed within the cultural sphere, where social, territorial and disaster risk elements are intertwined. Thus, in most of the cases directly or indirectly influenced by the 2010 earthquake, the initiatives are guided by educative, reflective and informative purposes. The initiatives are diversely deployed, and several actors revolved around them, including direct collaborators, stakeholders, and audiences. Stakeholders, when they exist, include people and organizations from scientific, technical and culture realm, and from governmental, civil society, academia and private spheres. From the DRM system, firefighters are underlined, and ONEMI and SERNAGEOMIN are mentioned in some cases. Municipalities are also a relevant for the participants, but the relations involve some difficulties. The role of media is also

highlighted in some cases. The participants acknowledge the complexity of disasters and work developed from the "willingness", placing value on networks, research and access to diverse information/knowledge. The achievements perceived revolve around developing audiences and networks, placing value on the ´local´ sphere, and boosting impacts on the public realm. The **tensions and challenges** include centralism, which is expressed in terms of discourses, educational practices, and the storage and production of knowledge; the emergency of disaster memory, which is related to the young national DRM culture, the lack of political will to support initiatives, the low priority of DRM, and the people´s reluctancy to remember; operational difficulties, referred to time, collaborators, funding, and networks issues; and contested topics.

Firstly, regarding 2010 earthquake and tsunami, for most of the participants it meant either a relevant lived experience and/or the initiative trigger[9]. Accordingly, this work complements Gonzalez-Muzzio and Sandoval Henriquez (2016) research, whom found that the earthquake implied the beginning of many emergent groups, after the long period of military dictatorship (1973-1990) where the role of local NGOs and other social organizations was diminished or suppressed. Thus, some of these groups became formal organizations after the emergency period, being highly educationally and training oriented. "A sense of abandonment or lack of attention from authorities, and the slow and erratic State response" (Gonzalez-Muzzio and Sandoval Henriquez, 2016, p. 8) are described as the triggers of those organizations, which contrast with the disaster memory initiatives, whose motivations, in general, seem to show more reflective and identitarian processes looking for mid/long-term cultural changes.

In terms of **disaster memory as a process - practice**, and oriented by McEwen *et al.* (2017)´s framework, the relevance of the findings can be understood in terms of building, organizing, and sharing disaster memory. Regarding *building disaster memory*, the initiatives can be highlighted for their processes of searching and gathering historical archives, scientific research and local knowledge; and for providing opportunities for disaster memory transmission. This is consistent with McEwen *et al.* (2017), who found that lay knowledge can be derived from communicative,

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[9] Despite this, it is important to clarify that the initiatives address different disasters, including events that happen before 2010 earthquake.

intergenerational and archival memory. Archival and scientific resources, as were detailed for an initiative, are particularly relevant for very infrequent hazards, where memory can easily fade. Getting different types of resources underline the relevance of stakeholders and/or supplier organizations, such as archive's institutions, scientists, technical and research organizations, media and, importantly, people able to share their stories. Regarding transmission, all the initiatives, in different degree, support this process, and in some cases they boost connection of vertical and horizontal axes of memory, which is relevant for memory practice (McEwen *et al.*, 2017). Importantly, horizontal exchanges through social media have been reported as often disconnected from vertically integrated memories (McEwen *et al.*, 2017), showing that different platforms can be better for one or another type of transmission. Besides generations, the role of family underlined by one interviewee has been highlighted in literature (Olick and Robbins, 1998), because it also shapes how we construct the past.

Another aspect of disaster memory as a process refers to *organizing memory*. Thus, although the initiatives are not meant to store and archive memories, it is possible to highlight three significant matters. Firstly, the initiatives underline the relevance of different sources of information and knowledge, but also certain difficulties accessing public archives. The latter has been reported in other settings, where it has been describe as partial and uneven, and perceive as places 'where experts go' (McEwen *et al.*, 2017, p. 23). Secondly, in most of the cases, the initiatives themselves, through their online platforms, social media, publications, and their structures, are constituting, in greater or lesser degree, and not necessarily in an organized or a systematic way, repositories of multi-disciplinary knowledge. Here internet and social media can play a relevant role. For example, memory banks can allow collecting and preserving memories, and also they can work as cathartic platforms (Recuber, 2012). In turn, social media has contributed to the perception of lay archives as more accessible (McEwen *et al.*, 2017). Finally, through the example given by one initiative regarding the development a citizen archive to be delivered to the National Archive, it is possible to realize the potential of the initiatives in terms of archiving local memory and placing value on people experience, which is relevant for local resilience (Dekens, 2007; McEwen *et al.*, 2017).

With regard to *sharing disaster memory*, and considering the described above, the initiatives seem to play a mediator role, which is exercised through articulating different types of resources and

actors with local memory, by means of evolving platforms, networks and activities that interact with different audiences. Diverse modes of memory expression are part of the initiatives, which have been reported before, such as commemorative events, museums, online platforms, workshops, photo exhibitions, among others (e.g. Recuber, 2012; McEwen *et al.*, 2017; Cortés *et al.*, 2018; Xu, 2018). What it is interesting is how contextual and current issues are taken to frame past events through dynamic processes and searches, which bring to mind the fact that memory is built in the past as much as in the present (Báez Ullberg, 2018). The mediated spaces provided by the initiatives can be seen as an opportunity to share memories and develop reflective processes. Here, media can play a relevant role as has been observed in some cases. Particularly radio, highlighted by one interviewee, has shown to be relevant in the context of other national disasters, like 2015 Atacama mudflow, where it, unlike television, was considered a more local and contextualized media, accessible by people of different ages in contrast to media such as internet (Aldunce Ide, Mena Maldonado and Lillo Ortega, 2018). Now, disaster memory for resilience requires processes of rehearsal and translation of archived memory into practice local knowledge (McEwen *et al.*, 2017), where the orientation and participation of the DRM system actors is key. However, despite the two more DRM-oriented initiatives, the articulation with the DRM system seems to be still incipient. As it was mentioned in Findings, the 2015 Atacama mudflow also showed firefighters as a relevant trusted actor, according to the community, in terms of information during emergency; also, the role that municipalities should have providing information to community was emphasized (Aldunce Ide, Mena Maldonado and Lillo Ortega, 2018).

Turning now to tensions and challenges related remembering and forgetting, the participants highlighted several issues that can be summarized in terms of enabling environment, audiences and stakeholders, and contested matters. In relation to *enabling environment*, it is affected by centralization and the incipient development of disaster memory. Particularly, decentralization is not consolidated yet in the country, situation that is replicated in the risk management system (Lacambra *et al.*, 2015). The participants illustrate how the prevalence of central regions determine dominant narratives, and the location of knowledge production and storage. In contrast, Lakhani and de Smalen (2018), in the context of policymaking, recommend the consideration not just of dominant narratives, but counternarratives as well. Also, the accessibility

to knowledge and archives by all groups is relevant for local resilience (McEwen *et al.*, 2017). The emergent status of disaster memory, in terms of enabling environment, is related to a still low valuation of disaster memory in the DRM system, a lack of political will to support civil society initiatives, and the low prioritization of risk management in general. The disregard of memory can be seen as part of a broader issue, since until recently local knowledge had been relegated from disaster literature and institutions (Dekens, 2007). Besides, gaps regarding participation and integration of local perspectives still remain in the national DRM system (Lacambra *et al.*, 2015; Espinoza, 2016), and the recognition and use of local knowledge by disaster managers has been reported as an emergent issue (Tironi and Manríquez, 2019).

Regarding *audiences and stakeholders*, interviewees experiences shed light on people´s institutional mistrust leading to reluctancy to commemorate publicly (so they do it privately), people´s desire to forget or deny the experience, and difficulties with local governments. The first two points may affect collective and/or individual memory work, leading, eventually, to active forgetting. McEwen *et al.* (2017) reported active forgetting related to the link of floods with trauma, mostly in a setting where residents had scarce flood experience; additionally, the authors observed that remembering involved memories of the emotion. These issues highlight the relevance of care and participative spaces to share experiences that can relive painful events, where experiences such as the one developed by Espinoza, Osorio-Parraguez and Reyes (2016), can contribute to psychosocial recovery. Now, regarding local governments, and local institutions in general, their relevance in terms of DRR/M has been highlighted previously (Delica-willison and Gaillard, 2012; Aldunce Ide, Mena Maldonado and Lillo Ortega, 2018), and their role in disaster memory initiatives is acknowledged by most of the participants, although rigid structure, bureaucracy, short-term orientation practices and conflictive relationships are identified. Similarly, in Chile, Gonzalez-Muzzio and Sandoval Henriquez (2016) reported the relation of community-based organizations and local authorities as irregular and often conflictive; and the cooperation between NGOs, community leaders and authorities, related to DRR and resilience, as rare.

Finally, *contested matters*, such as the example given by an interviewee regarding the 2010 earthquake memorial, have been reported in different settings (Báez Ullberg, 2018; Xu, 2018). Here, processes aimed to understand how a disaster is remembered by people and organizations

affected, and its impacts, should be conducted by policymakers before developing official monuments and commemorations in the immediate disaster's aftermath (Báez Ullberg, 2018). Additionally, despite the dictatorship heritage of memory was referred as a contextual matter by some interviewees, under its reference underlie a disputed and traumatic societal experience, whose impacts still remain to this day.

In terms of **community resilience**, three interesting matters can be highlighted. Firstly, the initiatives, and more clearly the online platform, contribute to understand *community* beyond the common concept of "an entity that has geographic boundaries and shared fate" (Norris *et al.*, 2008, p. 128). Instead, they shed light on memory as a relevant connector of people, which is consistent with the idea that "remembering and resilience are necessarily social connective processes involving disparate communities beyond those of place" (McEwen *et al.*, 2017, p. 16). Now, in terms of resilience resources, the potential of the initiatives resembles mostly two of the four main sets proposed by Norris *et al.* (2008): social capital, and information and communication. Regarding *social capital*, or the resources provided by social networks (Norris *et al.*, 2008), the establishment of dynamical inter-organizational networks; the provision of social support referred to emotional and informational matters; and the promotion of community bonds and roots, such as sense of community, place attachment, and citizen participation, are relevant elements fostered or that can be fostered by the initiatives.

In relation to *information and communication*, the initiatives contribution is related to online/in person systems to inform the public, and the promotion of communal narratives and shared meanings around disasters. The latter can be relevant for mental and spiritual recovery, as was illustrated by the psychosocial intervention developed by Espinoza, Osorio-Parraguez and Reyes (2016), and can support the development of a sense of place and connectedness, both relevant for resilience. In fact, the frequent interviewees' references to disasters resembles to what McEwen *et al.* (2017) call 'watery sense of place', meaning that living with water and associated issues is part of self and place collective narratives. In addition, regarding information and communication, media was highlighted by the interviewees in terms of making the initiative visible, as an educational platform, and as a resource of information that allows to understand perceptions and events' impacts (e.g. newsletter covers used as a bibliographic source and for public exhibitions).

Consistently, Norris *et al.* (2008) mention the potentiality of media in terms of public education, and also highlight its relevance as an influencer in how survivors and other actors understand an event, including emergency managers.

Overall, and considering the initiative´s experiences and linkages, and the perceived achievements, the initiatives can be considered as the result of particular and/or collective action, and as potential platforms for collective action for communities' resilience at different levels. Collective action is part of community competence, the third set of resilience capacities described by Norris *et al.* (2008).

Moving on now to consider the **disaster management cycle**, it is possible to see that the disaster memory initiatives are mostly preparedness oriented, through informing, educating and promoting people awareness. Although, the inclusion of commemorative events and psychosocial interventions, highlight the potential of the initiatives in recovery phase. Thus, the sets of resilient capacities mentioned in the paragraphs above, can be differently displayed across the disaster cycle, playing different roles (Kwok *et al.*, 2016). Particularly significant is the fact that the initiatives, trough processes of research and gathering different types of information and knowledge, can potentially contribute to the identification and knowledge of risk, and people involvement in DRM, both weaknesses of the current national DRM system (Lacambra *et al.*, 2015). In fact, as said by Dekens (2007), local knowledge can be an entry point for people engagement, and can guide communication tools for DRM.

Having discussed the significance of the findings, it is relevant to highlight some **lessons learnt** through this study. Firstly, although the initiatives studied share some similar purposes, they also present particularities. The diversity is a valuable aspect to be considered when it is about integrate memory in policymaking (Lakhani and de Smalen, 2018). Secondly, as it was revealed by the interviewees, strong memory-knowledge relationships require not just supporting the current or potential initiatives, they also imply addressing the factors that difficult these relationships and, if possible, using them in favorable ways, and promoting an enabling environment. For example, the initiatives could be benefited trough establishing/strengthtening the exchanges between them, and with other memory initiatives, such as the ones related to human rights. Thirdly, in a

dynamic and innovative twist, what these initiatives are showing us, and what could be beneficial for DRR/M realm, is the need to look for new languages closer to our social and individual nature and that, at the same time, match with the unpredictability of disaster phenomena. More specifically, when it is about fostering people participation and responsibility, information distribution is not enough, it is also necessary to get people interest and make sense for them according to cultural, territorial and current issues, acknowledging complexities and dynamics. Complementary, as Wisner, Gaillard and Kelman (2011) mention, authorities should consider, in their planning processes, diverse knowledge-bearers, including those from arts and humanities, social sciences and lay people, since economists, engineers, natural scientists, military and police experts alone are too frequently in charge of disaster planning. Finally, if risk perception is a social and cultural construction (García Acosta, 2005), and local knowledge is culturally internalized (Dekens, 2007), it makes sense to integrate locally and culturally framed initiatives to promote risk awareness.

Finally, there is abundant room for **further research** regarding disaster memory in Chile. Firstly, several actors highlighted in the disaster memory initiatives were not considered. Thus, audiences, regional and national DRM practitioners, archive institutions, scientific research centers, media organizations, and other disaster memory initiatives, could shed light on interesting perspectives related to memory-knowledge relationships that, in turn, can contribute to improve the DRM system. Importantly, more research is required in terms of audiences, since the maintenance of memory and its potentiality in terms of knowledge for community resilience, is finally related to "active 'rememberers' and listening audiences across generations" (McEwen *et al.*, 2017, p. 25). Also, since not all the initiatives are DRM-oriented, it would be relevant to understand how the acquired knowledge is being framed by audiences, particularly in terms of hazards' anticipation and adaptation, both relevant for disaster preparedness (Dekens, 2007). Additionally, even it was not the research focus, it was noticed that a gap regarding elderly have been highlighted (Espinoza, Osorio-Parraguez and Reyes, 2016; Torres Méndez *et al.*, 2018), referred to their vulnerability and the lack of strategies oriented to addressing their needs. Clearly, it should receive more attention not just in terms of aid and addressing vulnerability, but also in terms of highlighting this population regarding its role in local knowledge and memory transmission. Now, to develop a full picture of the initiatives, more research should be done about their material

and/or online deployment, including the interaction with audiences, people that is not accessing to the initiative, and missing topics that could be relevant for community resilience. As it has been reported, local knowledge is influenced by gender perspectives (Dekens, 2007; Torres Méndez *et al.*, 2018), thus, it would be a relevant and transversal view that can be considered. Finally, the use of local knowledge implies ethical and practical questions related to social justice, because it can be used against people and in a way that keeps the status quo (Dekens, 2007). Therefore, it is relevant to take actions oriented to people protection and engagement, so that the use of memories and local knowledge produce benefits that they perceive as significant.

CONCLUSION

Chile is highly prone to disasters triggered by natural hazards. There the current DRM public policy highlights participation and distribution of responsibilities, which are related to people and community's knowledge. Local knowledge can be crucial for community resilience, and memory, a source of the former, is also relevant because it influences present understandings and anticipatory actions. However, memory has been scarcely studied. This research set out to explore the experiences of disaster memory initiatives carried out by civil society and local governments in Chile, based on in-depth semi-structured interviews and thematic analysis. The findings highlight initiatives' strategies, and tensions and challenges. The strategies show that the initiatives, despite some of them are more DRM-oriented, they are essentially framed within the cultural sphere, where social, territorial and disaster risk elements intertwine. Oriented by educative, reflective and informative purposes, the initiatives are diversely deployed in the public arena, and different actors revolved around the initiative´s dynamic development. The complexity of disaster phenomena and the operational constrains, place value on the establishment of diverse networks, even if they do not exist yet, and the use of varied resources, including scientific information, local knowledge and media, to carry out the initiatives. The tensions and challenges revolved around centralization, disaster memory as an emergent issue, operational difficulties, and contested topics. Trough the exploration of disaster memory initiatives, the study contributes to our understanding of memory as a practice/process, as part of community resilience and as part of the disaster management cycle. Additionally, the research highlights impacts of 2010 earthquake and tsunami in terms of community resilience.

In fact, this study has shown that most of the initiatives are directly or indirectly influenced by the 2010 earthquake and tsunami, contributing to document the impacts of the event in relation to collective action. Previous studies reported that after a long period of military dictatorship (1973-1990), where social organizations where diminished or suppressed, the 2010 earthquake and tsunami implied the start of emergent groups that, after the emergency period, became formal organizations focused mainly on educational and training purposes (Gonzalez-Muzzio and Sandoval Henriquez, 2016). The disaster memory initiatives, although having similar purposes, as they were not meant to respond to emergency issues, they seem to be "**second-wave**" projects, which are guided by mid/long-term perspectives oriented to cultural changes.

The research has also shown that the initiatives are the dynamic result of individual and/or social interests and learnings, acquiring specialized **memory practices** on the way that articulate diverse modes of expression, networks, and resources, and interpret and use different inputs that feedback the initiatives and influence decision making. The experiences of the initiatives allow to understand their own and contextual issues regarding building, organizing and sharing disaster memory, which, as a whole, has been define as a good practise for local resilience (McEwen *et al.*, 2017). In terms of building memory, the initiatives contribute to search and gather different kinds of resources to complement or to construct memory when it is scarce, and they facilitate processes of vertical and/or horizontal transmission. Regarding memory organization, the initiatives highlight the relevance and some difficulties accessing public archives. Besides, the initiatives itself, not necessarily in an organize or a systematic way, work as repositories of multi-disciplinary knowledge, and, as shown by one initiative, they have the potential of organizing and promoting the local knowledge archives stored in public collections. In relation to sharing disaster memory, the initiatives seem to play a mediator role, which is exercised through articulating different types of resources and actors, by means of evolving platforms, networks and activities, which interact with varied audiences. These mediated spaces can provide opportunities to share memories and develop reflective processes, where the participation of DRM actors is desirable, but still incipient. Media, under this framework, has the role and/or the potentiality as a source of information, as a platform to potentiate the initiative, and as an educational platform.

In terms of **community resilience**, through their practices, the initiatives contribute to the understanding of community beyond location, highlighting memory as a social connector. Besides, the initiatives can potentially contribute to social capital, and information and communication, both sets of networked adaptative capacities for resilience (Norris *et al.*, 2008). The potential of the initiatives in terms of social capital is related to the establishment of interorganizational networks; the provision of social support, and the promotion of community bonds and roots. In relation to information and communication, the initiatives contribution is related to systems for informing the public, and the promotion of communal narratives and shared meanings around disasters. Overall, the initiatives have the potential to serve as platforms of collective action, which is part of community competence, a third set of resilience capacities described by Norris *et al.* (2008).

Regarding the **disaster management cycle**, the initiatives are currently preparedness-oriented, through public education, information and by promoting people´s risk awareness; although some of the initiatives exhibit experience and/or potential for disaster recovery, particularly through spiritual and mental health healing. The initiatives, through their processes, could contribute to identification and knowledge of risk, and to people engagement, two weaknesses of the national DRM system (Lacambra *et al.*, 2015). Additionally, the still scarce governmental initiatives that include aspects related to memory in the context of disaster, could be benefited by the inclusion of the experiences and perspectives of the disaster memory initiatives studied.

Several questions still remain unanswered, so further study is suggested in the following topics. **Actors involved in the initiatives**, including audiences, DRM practitioners, archive institutions, scientific research centers, media organizations, other disaster memory initiatives; **elderly population**, as a very vulnerable sector of society and, in turn, crucial for transmission of experiences and knowledges related to disasters; **material or online deployment of the initiatives**, including the interaction with audiences, groups that are not accessing to activities developed, potential missing themes that could be relevant for community resilience; **gender perspectives**, as a transversal axis for the different topics to be studied; and **ethical and practical questions related to social justice**, in order to define measures that protect people from using knowledge against them, or the instrumental use of knowledge in a way that keeps the status quo.

Overall, the study of Chilean disaster memory initiatives contribute to memory studies trough practical insights referred to disaster memory as a practice; to disaster studies by highlighting new actors, practices and languages that, not necessarily from a DRM-oriented view, are anyway, contributing to inform on and promote risk awareness; and to social sciences regarding disasters in Chile, through an initial exploration of what seems to be an emergent movement towards disaster memory, oriented to culture and social sciences, with current and/or potential contribution to DRR/M. Additionally, the findings, despite their exploratory nature, suggest some potential implications for future practice and public policy. Particularly, the relevance of integrating other languages, tools and actors in planning processes meant to increase knowledge for resilience; of research and addressing factors that counteract disaster memory, and factors that difficult the existence of an enabling environment to develop civil society and local initiatives relevant for resilience.

Finally, it is relevant to consider that, although the availability of knowledge within communities is relevant for participation and to foster co-responsibility in DRR/M, it is also relevant to address the deeper causes that determine vulnerability. Sometimes people remain in risky areas not because they lack awareness or knowledge, but instead for livelihoods possibilities, roots, among others. In this sense, we should not lose sight that community resilience is intimately related to the ability to "develop economic resources, reduce risk and resource inequities, and attend to their areas of greatest social vulnerability" (Norris *et al.*, 2008, p. 143), where solve inequities is a key issue in Chile, as was shown by the massive demonstrations started in October 2019. Additionally, besides fostering community resilience, it is also relevant to provide people with resources that allow them to act upon, and importantly, the concept of co-responsibility should not degenerate into a reason for denying help to individuals or communities in crisis. Finally, I personally consider disaster memory as a duty when it has to do with potential effects in human life, health and livelihoods.

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ANNEXES

Annex 1: CHILEAN DISASTER RISK MANAGEMENT SYSTEM IN BRIEF

Disaster risk management evolution in Chile

As in other countries in the world, the main changes and strengths of the DRR regulatory framework and institutions in Chile have originated after strong disasters (DG ECHO, UNESCO, PNUD, Cruz Roja, 2012). In recent times, as a United Nations (UN) member state, the country signed the **Hyogo Framework for Action (HFA)** in 2005, through which Chile committed to increase its resilience. According to the problems revealed by the 27th February 2010 earthquake and the results of the 2010 UN assessment of the progress of HFA in the country, in 2012 the **National Platform for Disaster Risk Reduction** (Plataforma Nacional para la Reducción de Riesgo de Desastres, PNRRD) was launched, an organization headed by the **National Emergency Office** (Oficina Nacional de Emergencia, ONEMI), whose first task was to develop the first **National Policy on Disaster Risk Management** (Política Nacional para la Gestion del Riesgo de Desastres, PNGRD) in order to reach a comprehensive DRM in Chile (ONEMI, 2016b). The PNGRD, is developed under a multi-hazard approach and is structured through five strategic priorities, which are in line with the five priority actions of the HFA (ONEMI, 2016b). The policy was presented to the President of the Republic in 2014, and was approved in 2016 though Decree N° 1512; the PNRRD, in turn, was formally constituted in 2015 as a multisectoral organization advisor of ONEMI, and it was intended as the main boost of DRR at national level (ONEMI, 2019d).

In 2014 the elaboration of the **National Strategic Plan for Disaster Risk Management 2015 – 2018** (Plan Estratégico Nacional para la Gestión del Riesgo de Desastres 2015 – 2018, PENGRD) began, which makes operational the 26 strategic objectives of the PNGRD through 84 actions (ONEMI, 2016a). The next year Chile signed the **Sendai Framework 2015 - 2030**, the HFA successor. Although the PENGRD was based on HFA priorities, since its elaboration started before Sendai framework was signed, the main concepts of this framework were integrated in order to address the current compromises (ONEMI, 2016a). It is said that the national policy and strategic plan on disaster risk reduction for the period 2019 – 2030, is under review before approval and legal support via Decree Supreme (ONEMI, 2018).

Additionally, there is a **National Strategy for Research, Development and Innovation (R+D+i) for a Chile Resilient against Disasters of Natural Origin** (Estrategia Nacional de Investigación, Desarrollo e Innovación para un Chile Resiliente frente a Desastres de Origen Natural), whose purpose is to "make Chile a more resilient country against natural threats through original responses in R+D+i that positively impact its development" (CNID, 2016, p. 4), considering a 20-year period. The strategy is oriented by Sendai Framework compromises, it is focused on the six main hazards in recent geological times, and it is structured by 14 tasks grouped in four dimensions of resilience, including also five enabling conditions (CNID, 2016). One of the enabling conditions refers to the creation of the Institute for Disaster Resilience (Instituto para la Resiliencia ante Desastres, ITRenD), which was inaugurated in August 2019 (ITREND, 2019).

Current Disaster Risk Management system in Chile

The **National Civil Protection system** (Sistema Nacional de Protección Civil, SNPC) is founded on the Political Constitution of the Republic of Chile, which states that "It is the duty of the State to protect the population and family" (Article 1, paragraph 5) (ONEMI, 2016b). The **National civil protection plan** (Plan Nacional de Protección Civil, Supreme Decree N°156/2002) establishes the organizational and administrative structure of the SNPC, being the base of the risk management model in Chile (ONEMI, 2016a). In this context the role of **ONEMI** is key. ONEMI, created though the Decree of Law N° 369/1974, is a technical organism of the state, dependent on the Ministry of the Interior and Public Security, in charge of the coordination of the SNPC, being its mission to "plan, coordinate, organize, advise and supervise the activities of the SNPC to reduce the risk of disasters through mitigation, preparedness, alert, response and rehabilitation in order to reduce the loss of life, reduce economic impacts, environmental effects and protect livelihoods, contributing to sustainable development" (ONEMI, 2019c). ONEMI has representation in the 16 regions of the country through Regional Directorates and one central office in Región Metropolitana (ONEMI, 2018). Additionally, Regional Governments, though intendants and governors, must develop measures to prevent emergencies and catastrophes and to cope with them (República de Chile, 2005); the Municipalities, in turn, can develop functions related to risks prevention and aid provision in emergency situations (República de Chile, 2006).

The SNPC consist of different actors representing public and private sectors, including voluntary organizations and organized community; its work is executed at communal, provincial, regional and national level, where each level is headed by its respective political authority (República de Chile, 2002). Each administrative level considers a **Civil Protection Committee** (Comité de Protección Civil) in charge of developing and executing programs and activities related to prevention, mitigation and preparation according to the jurisdictional area. Once an emergency has been declared, the **Emergency Committee** (Comités de Operaciones de Emergencia) is constituted in its respective administrative level, and it will develop its mission in an **Emergency Operations Center** (Centro de Operaciones de Emergencia, COE).

The national **Early Warning Center** (Centro Nacional de Alerta Temprana, CAT) is the ONEMI's unit in charge of monitoring risks in the whole country, being part its main tasks to establish and spread warnings to the SNPC in order to coordinate adequate responses. The center works 24 hours a day every day through regional CAT and different technical agencies from the SNPC. Among these agencies, it is possible to mention the **Chilean Navy Hydrographic and Oceanographic Service** (Servicio hidrográfico y oceanográfico de la Armada, SHOA), the **National geology and mining service** (Servicio nacional de geología y minería, SERNAGEOMIN) and the **National Seismology Center** (Centro Sismológico Nacional) (ONEMI, 2019a).

In addition to the mentioned above, in terms of regulations, there are other legal bodies that promote DRR, including topics such as budget, monitoring and early warnings systems, territorial planning, buildings seismic design, state of exception, among others (ONEMI, 2016a).

There are also actors from humanitarian and civil society realm, and international networks that contribute to DRR/M actions in Chile. Some organizations such as Chile firefighters, Red Cross and some NGOs, have acquired experience in DRM and are part of the **Global Network of Civil Society Organizations for Disaster Reduction** (GNDR); additionally, it is possible to mention the **Chilean humanitarian aid network** (Red de Ayuda Humanitaria Chilena, RAHCh), and the multiple UN agencies present in the country. These actors are permanent collaborators of ONEMI (ONEMI, 2016a). In terms of the international networks where Chile participates, it is possible to mention, among others, the **Inter-American Network for Disaster Mitigation** (INDM), established by

resolution of the Organization of American States (OAS) in 2007; the **Pacific Tsunami Warning System** (PTWS), established by the Intergovernmental Oceanographic Commission (IOC) in 1965; the **Action plan for secure hospitals** (Plan de Acción de Hospitales Seguros), headed by the Pan American Health Organization (PAHO), Regional Office of the World Health Organization (WHO) (DG ECHO, UNESCO, PNUD, Cruz Roja, 2012).

Finally, it is relevant to mention that the National civil protection plan from 2002 was the first institutional effort made to address explicitly risk reduction in a comprehensive way, impetus that was reinforced due to the consequences of 2010 earthquake and tsunami, shaping a new institutional approach (DG ECHO, UNESCO, PNUD, Cruz Roja, 2012). Thus, since March 2011 the bill that establishes the new **National System of Emergency and Civil Protection** (Sistema Nacional de Emergencia y Protección Civil) is under legislative process (República de Chile, 2011). The new system takes into account the creation of a Risk and emergency management service (Servicio de Gestión de Riesgo y Emergencia), which will replace ONEMI; additionally the system will consider an Advisor council (Consejo asesor) of experts; the creation of a Committee of Ministers (Comité de Ministros) that will review the strategy and the national plans; the formal inclusion of the Armed forces and Firefighters in the Emergency committees; people in charge of risk management in each Ministry and in each Municipality; and the creation of emergency offices at provincial level (at present time they only exist at regional level) (CNID, 2016). Thus, under this structure, it is expected that the system will develop actions of mitigation, prevention, preparation and response in a decentralized way (CNID, 2016).

Challenges of the Disaster Risk Management system

After 2010 earthquake and tsunami, many relevant improvements have been introduced to the national DRR/M framework (ONEMI, 2016a), although challenges still remain, including the approval of the new system mention above.

The assessment of the Index of Governance and Public Policy in DRM (iGOPP) (Lacambra *et al.*, 2015), resulted in an 'incipient' level of compliance, revealing important gaps in the normative framework, particularly the lack of a modern legislation in terms of fostering participation and establishing responsibilities. In fact, the key instrument, the 2002 National Civil Protection Plan,

was approved via Decree but under an indicative basis, giving it a character of recommendation instead of a duty. The iGOPP also showed an insufficient identification and knowledge of risk, meaning an insufficient extension and integration of information about threats and vulnerabilities that it is necessary to facilitate decision making. Additionally, the system reproduces the centralization, which is a national issue, and the territorial and central regulation is focused on preparation and response. Finally, the index highlights the necessity of more development in the realm of financial protection to deal with disaster risk (Lacambra *et al.*, 2015).

Overall, the current system has been characterized by a reactive approach (Lacambra *et al.*, 2015; CNID, 2016). Also, it is said that the ONEMI´s budget is not enough to address prevention and educational tasks; instead, a major budget is oriented to recuperation and reconstruction actions (Espinoza, 2016). Increasing monitoring network for climatological variables, increasing education and participation, and addressing local perspectives, are other issues that have been highlighted by researchers (Espinoza, 2016). Addressing and looking into local level is particularly relevant considering the key role of municipalities and the fact that 68% of the 346 municipalities reported having a Commune emergency plan, meaning that the rest of the municipalities either do not have a plan or have a plan but did not inform it (ONEMI, 2019b).

INTERVIEW GUIDING QUESTIONS

Section 1: Introduction

- Greeting and appreciation for participate in the research.

- Personal presentation of the interviewer.

- Objective of the study.

- Type of participation: interview, length (1 hour), record (audio recording, notes).

- Characteristics of the interview: voluntary nature of the participation, confidentiality, protection of personal information, right not to respond to what you do not want, access to results.

- Informed consent: review and sign.

- Questions of the interviewee to the interviewer before starting the interview.

Section 2: General background regarding the interviewee and the initiative.

Interviewee:

Age		Gender	
Home region		Main occupation	
Education (academic, experience)			

Initiative:

Type of organization that lead the initiative					
Governmental		Non-governmental		Other (specify)	
Organization area or unit in charge of the initiative (if applicable)					
Scope of deployment of the initiative					
Communal		Provincial		Regional	
National		Other (specify)			

Section 3: Interview guiding questions

1.   Introductory

- To start, could you tell a little about your role in the initiative to commemorate and/or place value in disaster memory?

2.   Purpose of the initiative

- When and why the initiative was launched?

- To whom is the initiative targeted?

- What change or impact do you expect to produce with the initiative?

3.   Deployment of the initiative

- Which are the processes required to execute the initiative? (probe for priorities definition, main processes, material deployment and technological means used)

- Could you tell me about the group of people or the team directly involved in the coordination of the initiative? (probe for number of people, roles, recruitment system)

- In order to carry out the initiative, has it been established any kind of partnership with other organizations or people? (probe for how the partnerships are began, and its characteristics)

- What is the role of the media in the implementation of the initiative? (probe for examples)

- How do you get the resources to carry out the initiative? (probe for types and resources sources)

4.   Role of the community

- What should a person do when she/he is interested in participate in your initiative?

- How do you know what the community wants or expects from the initiative?

  - Have there been any opinion differences among the community and other actors?

5.   Challenges and achievements of the initiative

- Which have been the major achievements attained by the initiative?

- Which have been the major difficulties in the development of the initiative? How did you solve them?

- In your experience:

  o How important is disaster memory for people and institutions? (probe for examples, actual situation)

    o (if interviewee consider that the topic is no relevant or if it is relevant but it is no reflected in practice) Which are the main challenges that disaster memory have to remain and attain a relevant position?

Section 4: Closing

- Gratitude to the interviewee for sharing its knowledge and experience.
- Is there anything else you would like to add before we close?
- Is there something I should have asked about, to understand this topic, but I did not?
- Do you know another active organized initiative dedicated to disaster memory in Chile?
- Explanation of the next steps.

Note: the version used in the study was written in Spanish.

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Informed Consent Document
"Characterizing organized initiatives to commemorate and/or place value in disaster memory in Chile and exploring its role in the national disaster risk management framework"
Student and researcher responsible: Nora Fredericksen | Supervisor: Emmanuel Raju

PART I: INFORMATION

You have been invited to participate in the research "Characterizing organized initiatives to commemorate and/or place value in disaster memory in Chile and exploring its role in the national disaster risk management framework". With this work we seek to learn about some organized initiatives that seek to commemorate and/or place value on disaster memory in Chile; to understand its purpose, the role of community, the challenges and achievements attained, and explore its link with the national disaster risk management framework. We have invited you to participate because you are and active part of this initiatives and we think that your experience can contribute to our understanding on this subject.

The researcher responsible of this study is Nora Fredericksen Neira, student of the program Master of Disaster Management, University of Copenhagen, Denmark. This study will be developed during 2019.

Before deciding whether participate or not in this research, it is important that you consider the aspects described below. If you have any doubt, please feel free to ask what is not clear.

Participation: this research will imply your participation in an interview of about one hour, which will be conducted remotely, though electronic devices, on a mutually agreed date and time. During the interview, you will be asked about the motivations to establishing the initiative, the characteristics of the initiative, the participation of the community, and the challenges and achievements attained. The interview will be conducted by the responsible researcher. If you do not want to answer a question, you can say so and the interviewer will continue with the next question. Nobody else but the interviewer will be present, unless you want someone else to participate. The interview will be recorded through audio recording and handwritten notes. The interview may be interrupted and/or resumed at any time if it is required. If it is necessary, we will contact you for and additional interview.

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Voluntary nature of the participation: your participation in this research is completely voluntary. You can answer the questions you want, as well as stop participating at any time, without giving any reasons. The decision you make will not cause harm to you.

Confidentiality: all the information you provide will be confidential and be kept under strict reserve. In the presentations and publications of this research, your name will not appear linked to any opinion. The audio, its respective transcription and the notes written during the interview will be stored in digital files identified by a code instead of your name. Only the responsible researcher, the thesis supervisor and the transcription / translation support person will have access to this information. The information collected will be stored by the researcher responsible for one year once it graded, in order to check information and eventually develop publications regarding this study. The information obtained from the interview will be used exclusively for purposes associated with this research.

Risks: there is a risk that you may share some personal or confidential information by chance, or that you feel uncomfortable talking about some of the topics. However, we do not wish for this to happen. You do not have to answer any question if you feel the question(s) are too personal or talking about them makes you uncomfortable.

Benefits and reimbursements: there will no direct benefits nor reimbursements to you for your participation in the study. However, your participation will allow to develop information to be use, potentially, in social benefit themes.

Access to results: you will receive a summary of the results in Spanish, through a file sent via e-mail. Additionally, the complete thesis in English will be available if required.

Contact: in case you require more information or establish communication for reasons related to the research, you can contact the responsible researcher:

  Nora Fredericksen Neira
  - E-mail: norafn@gmail.com
  - Mobile phone: +45 50179762 (you can use Whatsapp)
  - Address in Chile: Avenida Holanda 3730, departamento 31, Ñuñoa, Santiago.

This research proposal has been approved by the University of Copenhagen.

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PART II: CERTIFICATE OF CONSENT

I_____(first and last name of the
participant) consent voluntarily to participate in the study "Characterizing organized initiatives to
commemorate and/or place value in disaster memory in Chile and exploring its role in the national
disaster risk management framework", in the terms indicated in this document. I have read the
foregoing information, or it has been read to me. I have had the opportunity to ask questions about
it, and these have been answered to my satisfaction.

Signature of participant	
Date	

Signature of responsible research	
Date	

This document is signed in two copies, one will be kept by the participant and the other will be
kept by the responsible research.

Note: the version used in the study was written in Spanish.

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Annex 4: CONFIDENTIALITY AGREEMENT WITH TRANSCRIPTION SUPPORT PERSON

Confidentiality agreement for people who access to information produced in the research "Characterizing organized initiatives to commemorate and/or place value in disaster memory in Chile and exploring its role in the national disaster risk management framework"

I _____(*first and last name of the person who access to the information*), as consequence to access to information produce by interviews conducted in the context of the research "Characterizing organized initiatives to commemorate and/or place value in disaster memory in Chile and exploring its role in the national disaster risk management framework", and in the role of _____ (*specify the role played in the research*), I am committed to:

- Keep the confidentiality and strict reserve of the information, without disclose it nor transfer it to third parties.
- Do not use the information, directly or indirectly, to gain personal or third parties' advantage, except for the functions related to the role that I play in the context of the research.
- Store this information only for the period in which I perform my work, and then remove it from my personal items.

Signature of the person who access to the information	
Date	

Note: the version used in the study was written in Spanish.