



# Coping Strategies and Tactics to Deal With Social Vulnerability in the Flood Disaster of March 25, 2015, in Chañaral and Diego de Almagro, Chile

Sonia Pérez Tello<sup>1,2\*</sup>, Paulina Aldunce Ide<sup>2,3,4</sup>, Fernanda Flores-Haverbeck<sup>1</sup>, Dania Mena Maldonado<sup>5</sup>, Carmen Paz Castro Correa<sup>2,6</sup> and Katherine Wyndham Vásquez<sup>6</sup>

<sup>1</sup> Department of Psychology, Faculty of Social Science, University of Chile, Santiago, Chile, <sup>2</sup> Center for Disaster Risk Reduction, Centro de Investigación Transdisciplinaria en Riesgo de Desastres (CITRID), University of Chile, Santiago, Chile, <sup>3</sup> Center for Climate and Resilience Research, Santiago, Chile, <sup>4</sup> Department of Environmental Science and Renewable Natural Resources, Faculty of Agricultural Science, University of Chile, Santiago, Chile, <sup>5</sup> Renewable Natural Resources, Faculty of Agricultural Science, University of Chile, Santiago, Chile, <sup>6</sup> Department of Geography, Faculty of Architecture and Urbanism, University of Chile, Santiago, Chile

## OPEN ACCESS

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### \*Correspondence:

Sonia Pérez Tello  
sonperez@u.uchile.cl

### Specialty section:

This article was submitted to  
Climate Risk Management,  
a section of the journal  
Frontiers in Climate

**Received:** 23 August 2021

**Accepted:** 14 February 2022

**Published:** 18 March 2022

### Citation:

Pérez Tello S, Aldunce Ide P,  
Flores-Haverbeck F, Mena  
Maldonado D, Castro Correa CP and  
Wyndham Vásquez K (2022) Coping  
Strategies and Tactics to Deal With  
Social Vulnerability in the Flood  
Disaster of March 25, 2015, in  
Chañaral and Diego de Almagro,  
Chile. *Front. Clim.* 4:763413.  
doi: 10.3389/fclim.2022.763413

A socio-natural disaster event exacerbates pre-existing socio-economic crises and disrupts the life projects of the people affected, generating the deployment of strategic or tactical actions to deal with it. When societies have populations living in conditions of social vulnerability prior to disasters, such actions are more complex and difficult to manage. On March 25, 2015 (25M), the inhabitants of the towns of Chañaral and Diego de Almagro, in the Atacama Region of Chile, were faced with a flood that produced a crisis of great magnitude. This qualitative research describes the actions the inhabitants used to reduce social vulnerability, before, during and after the emergency. These actions were analyzed to describe the extent of planning, meanings, resources and structures of opportunities present in the actions. Content analysis was carried out on semi-structured interviews with 38 affected people, selected using intentional sampling technique together with snowball sampling. Subjective resources were identified: sense of family, solidarity, autonomy and restitution of rights. The superimposed mobilization of these resources resulted in a complex situation of resilience. It is concluded that the way of learning actions includes family and cultural habits, daily learning and previous experiences, and imitation, among others. Recommendations are made to be considered for the reduction of risks of socio-natural disasters. Specifically, policies that include educational strategies that are based on the ways of acting shown by the communities.

**Keywords:** strategies and tactics, socio-natural disaster, Chile, floods, March 25 (25M), resilience, assets, social vulnerability

## INTRODUCTION

The effects that social processes have on subjectivity in Chile have been the object of analysis in recent decades, showing, among other aspects, that modern living brings with it an increased sense of instability, which makes people feel more vulnerable both individually and collectively (Araujo and Martuccelli, 2012; UNDP, 2014). One of these effects consists of the individualization

of risk management by persons (Straub, 2021), which means that, faced with the risk of having social trajectories interrupted as a result of a critical event, persons primarily manage their coping mechanisms individually, either out of shame or out of a sense of personal merit (Arteaga and Pérez, 2011; Araujo and Martuccelli, 2020). Socio-natural disaster situations constitute a critical event insofar as they are unexpected events that create crisis and destabilize daily life, social positions, and personal or family plans. Therefore, it is pertinent to understand the social vulnerability associated with disasters as a phenomenon built on previous subjectivities, with social experiences of uncertainty and individual learnings of other life uncertainties (Médor Bertho, 2019). The objective is to explore the subjective basis of the actions that individuals and families carried out in order to deal with the particular crisis situation generated by the floods on March 25, 2015 (hereinafter 25M), in the towns of Chañaral and Diego de Almagro, Atacama Region, Chile.

The analysis takes into account that the strategies for coping with socio-natural disasters have particular qualities in every territory, because they correspond to the result of the cognitive and affective disposition of people, such the appraisal of threat and context or place attachment, together with the situational determinants (Espinoza, 2014; Navarro et al., 2021). In countries like Chile, where social experiences and the relationships between individuals and society, wherein individual projects and day to day problem solving often take priority over collective projects (Garretón, 2010; Martuccelli, 2019). This individualization also occurs in risk management, to the extent that subjects assume the transfer of responsibility for social risk into their own daily practice, experiencing permanent fragility in their life experiences (Arteaga and Pérez, 2011; Arteaga, 2017). Furthermore, in a society with significant income inequality, access to resources necessary to face risks and problems caused by socio-natural disasters are also unequal. In addition, government experiences of risk management focused on economic recovery over human health and wellbeing enhance the individualization of risk (Straub, 2021).

The actions to face the vulnerabilities associated with socio-natural disasters can be described as strategies or tactics, as they have been previously described in studies carried out on Chilean society (Arteaga and Pérez, 2011) using the Assets Approach, Vulnerability and Opportunity Structure (hereinafter AVEO) (Kaztman and Filgueira, 1999; Kaztman, 2005). This approach proposes that social vulnerability results from the interrelation between the macrosocial sphere, called the “opportunity structure” (made up of the State, the Market, and society) and the microsocial sphere, where household assets are located. Therefore, the opportunities to access benefits or services depend on the utilization of individual resources or, in less cases, they are provided by the State.

The use of these resources, called assets, translates into more comprehensive, planned strategies rather than simple reactionary tactics (Moser, 1998, 2011). Tactics refers to actions that do not arise from rational decision-making processes (De Certeau, 1996; Pérez et al., 2008). These have been described as the most frequent actions utilized in situations of socioeconomic vulnerability in Chile (Arteaga and Pérez, 2011), since the chronic

instability of social positioning makes it difficult to make plans for actions aimed at achieving future goals. Tactics are then the least planned ways of acting, which are not the product of reasoned decision-making, and which are spontaneously improvised, with implicit senses being activated to solve emerging problems derived from the initial critical event.

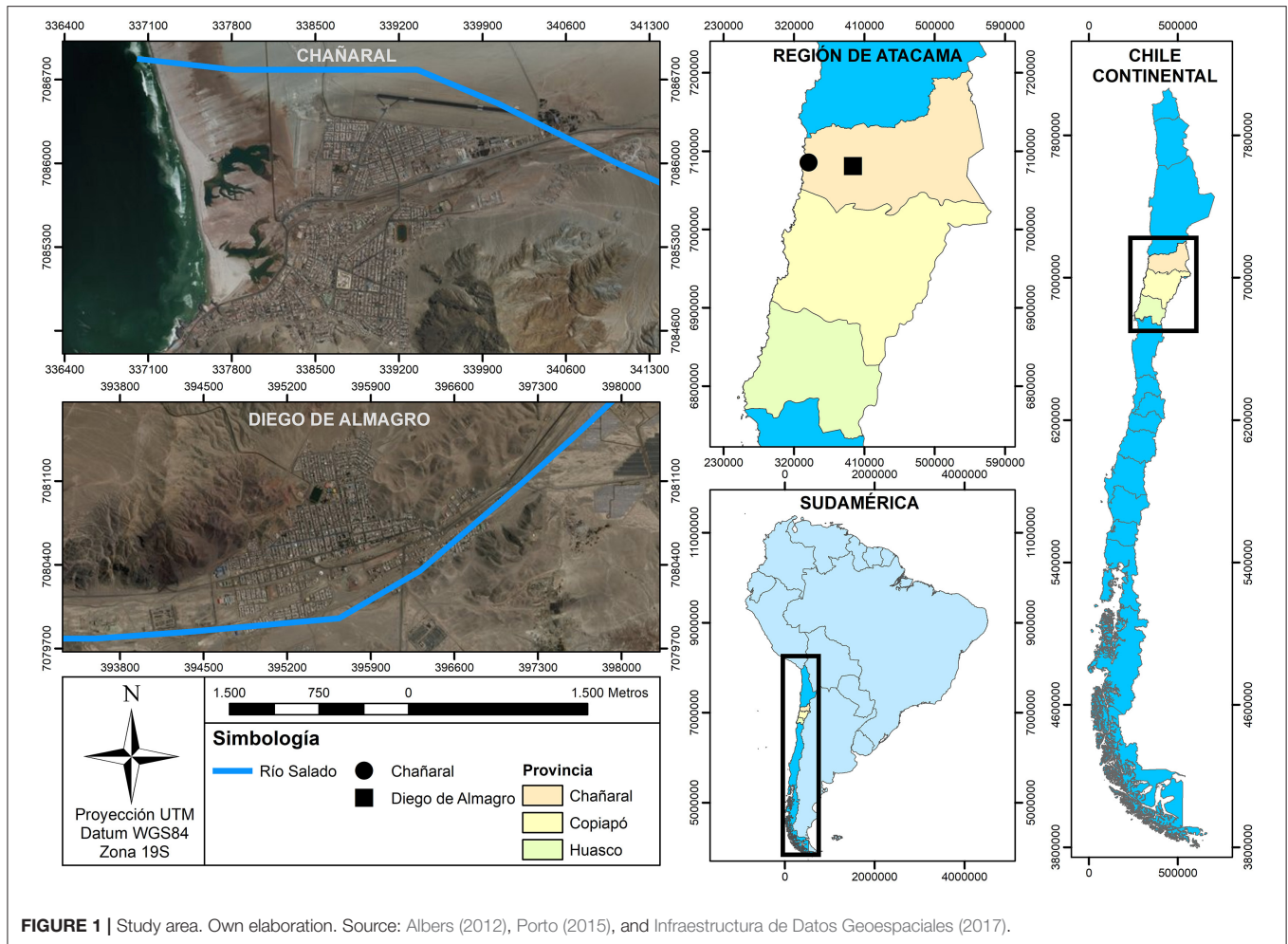
In the case of socio-natural disasters, the sources of opportunities available to individuals, families and communities to deal with the damage may be present prior to, during or after the critical event (understanding a critical event as the triggering of the threat that results in an emergency); and they can be used (or not) to control the social vulnerability that limits those affected to prevent, respond to and/or recover from such an event. Therefore, those meanings at the base of the actions become relevant (Tariq, 2021).

In such contexts, it is possible to assume that actions to adapt or overcome social vulnerability depend on what individuals, families and communities perceive as the main risk to be dealt with within the chain of risks that are linked to the disaster (Blaikie et al., 1994; Cutter, 1996; Cutter et al., 2003), for example: the risk of losing one’s social position after the loss of a job or income source; the risk of falling into poverty due to expenses associated with reconstruction; the risk of reducing access to quality education due to the loss of educational infrastructure or the risk of weakening family and neighborhood unity due to the need to relocate, among others (Larenas et al., 2015; Romero and Romero, 2015). In recent research, the social impacts of disasters for the most vulnerable groups tend to be exacerbated, including the pandemic for COVID-19, precisely because they are directly related to the event itself but also by socio, cultural and economic features (Tang and Li, 2021).

Although this knowledge explains the ways in which people in situations of vulnerability due to socioeconomic crises, subjective factors of behavior have not been considered in studies applied to disaster situations. This knowledge gap does not allow us to understand the lack of adherence of the communities to risk reduction policies or the behaviors that go in the opposite direction to them.

Therefore, the assumption that guides the present analysis is that, in a country like Chile with high levels of previously existing vulnerabilities (Programa de las Naciones Unidas para el Desarrollo (PNUD), 2014), subjects face disasters by preventing, responding and recovering from different social risks derived from the critical event in accordance with the meanings they have attributed to their life projects. This can specifically impact adaptation to disaster risk in different ways, either by strengthening resilience, or by making adaptive success more complicated in terms of the specific relationship with the natural environment (Aldunce et al., 2014).

The actions carried out by individuals and families who suffered the consequences of flooding in the towns of Chañaral and Diego de Almagro in the Atacama region of Chile are described here; before, during and after the critical event, based on the resources mobilized, the structure of opportunities utilized and the subjective senses that sustained the actions, analyzing their tactical or strategic nature in the resilient adaptation to the socio-natural disaster.



## METHODOLOGY

### Study Area

The research was developed in the towns of Chañaral and Diego de Almagro, located in the province of Chañaral, Atacama Region, Chile (Figure 1). Both are within the group of localities most affected by the 25M floods, since they are located near the Salado River. The natural channel of the Salado River—where the alluvial flow was mostly concentrated—was diverted into areas near public housing buildings in both towns, which worsened the impact of the flood. Most of the center of Chañaral near the coastal area and part of the mouth of the Salado River were impacted by the flooding, as well as areas near the channel. In general, there was a high level of destruction of homes and commercial premises, along with formations of sinkholes up to 15 meters deep along the coastline. Likewise, the town of Diego de Almagro was flooded, with the inundation coming from different fronts, affecting ~50% of the urban area, mainly adjacent to the old riverbed, and creating trenches of more than 3 m deep (CCT, 2015). The event caused a complex situation in the localities, due to the serious damage to infrastructure, basic services (drinking water and sewerage), the

environment, road connectivity, among others, which affected normal operation.

### Method

The design of this research is of a qualitative nature, utilizing methodology based on interest in the way in which the world is understood, produced and experienced from the perspective of its social actors; revealing their experiences, meanings, senses, knowledge and stories (Vasilachis, 2006; Jones and Tanner, 2017).

In order to collect data, three field campaigns were carried out, between April 9 and July 3, 2017, in Chañaral and Diego de Almagro, and semi-structured interviews (Flick, 2007) were conducted with 38 people directly and indirectly affected by the 25M event (see Table 1). The sampling used was non-probabilistic, combining two techniques. First, we used the technique of intentional or convenience sampling, which depends on the researcher’s criteria based on the objectives of the study. We mainly interviewed people who experienced the disaster event (Subban, 2009; Neuman, 2013). Once the first group of participants had been selected, chain or snowball sampling was carried out, which consists of asking the already identified informants if they know of, and can recommend other

**TABLE 1** | Categorization of the interviewees by gender, age and locality.

	Chañaral	Diego de Almagro	Total interviewees
<b>Gender</b>			
Female	15	11	26
Male	7	5	12
<b>Age range (as defined by the Chilean National Institute of Statistics INE)</b>			
18–29	2	0	2
30–44	5	5	10
45–64	11	11	22
65<	4	0	4

inhabitants who experienced the disaster event, including them into the sample (Hernández et al., 2010; Neuman, 2013). In this study it is understood that strategies and tactics contribute to build more or less resilience when they allow people to evaluate their own life with less subjective losses and better wellbeing. The interview included questions related to: (i) characterization (place and time of residence, socio-economic level, damages suffer by the flood, among others); (ii) information and knowledge they hold prior the disaster occurred; (iii) information and knowledge about what to do during the emergency (iv) what actions they carried out during the disaster and what they learnt from facing the disaster.

The data analysis applied was content (Flick, 2007). First of all, a temporal classification of the actions carried out by the interviewees before, during and after the flood occurred. Then, coding guided by the conceptual matrix of opportunity structure and type of actions was deployed. From the coding, the results obtained are presented in actions carried out in: (a) Days prior to the event: in this case, the week preceding the emergency is considered, when approaching rainfall for the northern part of the country was forecast; (b) During the emergency: from the afternoon of March 24 to the early morning of March 25, when the critical event manifested according to those interviewed, and (c) Post-emergency, which spans 3 days after the critical event, when interviewees reported that support began to arrive.

## RESULTS AND DISCUSSION

### Actions: What Was Done and Why?

The analysis of the interviews presented here is based on the following axiom: each action carried out by individuals and families before, during and after the emergency, consisted of mobilizing resources that they already had, either actively or passively. From the study of strategies and tactics deployed to confine social vulnerability in situations of economic crisis, it can be extrapolated that actions in crisis situations of socio-natural origin contain components that define their final characteristics, that is, they delimit what people do and how they do it when it comes to preventing, responding to, or recovering from disaster events.

The differences between the actions are then found in: (a) the type of resources that are mobilized, if they are subjective

(cognitive-affective), material, economic, sociocultural, natural, among others; (b) in which direction they are moving, that is, if they are oriented to the social or institutional structure; (c) the level of planning involved in these actions, if they are spontaneous or calculated; and (d) the source of learning from where these actions have been activated, where the information is transformed into knowledge.

Here it is described the dynamics of actions, in relation to the moment/circumstances which people are in when the critical event occurs.

### Days Prior to the Critical Event

In the days leading up a crisis such as a flood, people deploy two types of action that in many cases, although not all, turn out to be complementary: preventative actions and actions to mitigate the effects.

Preventive actions focus almost exclusively on supply. They mainly mobilize economic resources and take advantage of market opportunities. They are planned and have been learned in the family sphere or as cultural habits. The most frequent example of such action consists of the purchase of food and water as a response to bad weather warnings. This preventive action is strategy based, in part, on cultural learning related to the scarcity of water typical of the geographical area in which they live, where drought has become part of the daily life of families. However, the fact that the resource is economic, and the market is the main structure of opportunities, leaves the most used prevention strategy in a place of possible discrimination due to the economic limitations of the inhabitants.

“... We bought four twenty litre bottles of water, the day before...” (Woman, 50 years old, Diego de Almagro).

“On Friday I went to Copiapó and bought everything, I remember that I bought a hundred pounds of sugar, a hundred pounds of flour, I brought a lot of manjar (caramelized condensed milk), because I work making cakes, pastries, so I remember that I bought a lot of liquid milk, a lot of manjar, a lot of everything” (Woman, 46 years old, Chañaral).

The other actions carried out prior to the critical event are mitigating ones, in this case there were two: transmitting information about the level of risk and stacking sandbags to create barriers against the possible entry of mud into their homes. For both, social resources are activated, such as friendship or family networks and the means of social communication. These resources are aimed at opportunities also offered by society itself, not so much by the market and the State. They are mostly spontaneous actions, learned in daily life and previous experiences of disaster, whether firsthand or observed.

When it comes to transmitting information, it should be noted that almost all the people interviewed indicated that, as soon as they received information about the risk of flooding, they immediately focused their time and effort on “warning”, “advising” and/or “convincing” family members and neighbors—and even the municipality itself—about the possible worsening of the critical situation and, therefore, of the need to evacuate. The most frequently used communication channels

were the telephone and face-to-face verbal communication. These individual tactics take more time and effort than other broader strategic actions that would address protection of property and belongings, or facilitate mass evacuations, paying particular attention to those who are most vulnerable (the elderly, children and disabled people).

“The day before –that helped a lot, being cautious– I remember that the day before when the rain in Santiago started, my sister called me: ‘collect water’ she said ‘that they are warning that there will be rain in the north, a lot of rain, gather water, they are going to cut off the water’” (Woman, 50 years old, Diego de Almagro).

Stacking sandbags behind the doors of houses is a strategic action of immediate planning (very close to spontaneity) that seeks to prevent water and mud from entering homes. It is an action learned socially from previous experiences, firsthand or observed and is mainly oriented to the protection of the family nucleus.

“It flooded the houses a bit, my aunt lived in front, so we helped her to put sandbags in front of her place, as now the neighbors in front, they were all putting out sandbags” (Woman, 48 years old, Chañaral).

### During the Emergency

When critical events are triggered, the resources are almost exclusively mobilized by family members and their actions are oriented toward survival and the protection of one’s own physical health and that of children and close relatives. Such actions include feeding and caring for one’s own children or those of close relatives and moving the family to a safe place.

Keeping the family unit together is the central purpose of these actions, expressed in efforts to “stay together on the street”, “evacuate all together”. Thus, staying together and accompanying each other are the most frequent expressions that support decisions about preferences about what to do or where to go. Moving to a safe place is then an action that necessarily seeks to guarantee family unity. Decisions about where to stay are traversed by the concrete possibility of being together.

“We came, we came home... because that is my mother’s house, this was my house, we stayed at my mother’s house, we did not separate” (Woman, 65 years old, Chañaral).

With no strategic preparations or prior experience of a disaster of extreme magnitude, people are poorly equipped to respond effectively. In addition, the cultural importance of keeping family members together can result in people taking greater risks, such as traveling through dangerous areas to rescue family members or a pet.

Other actions are based on a sense of solidarity: inviting neighbors to lunch/dinner, helping to clean mud and debris from houses, rescuing pets, sharing or lending cars for evacuations, helping to evacuate people with limited mobility, locating missing people. Although these actions have a collective meaning, they are spontaneous tactics that are not based on learning or knowledge but rather the activation of affective and social

resources (such as empathy, compassion, and trust) as well as economic and material ones. This is a central characteristic of these solidarity tactics: the complexity and overlap of resources that are mobilized to decide, for example, where to take refuge, when to do it and whom to support. Specifically, these tactics can be differentiated into protective solidarity (when it comes to saving the integrity of another person) and focused solidarity (when it comes to supporting the recovery of those who cannot do so alone).

“... later my husband went down anyway, because we didn’t have anything to eat; other people took things with them and we couldn’t manage to bring anything; so, he went down to see what could be recovered from the house, and then some friends were waiting for him there, and told us to go to his house” (Woman, 35 years old, Diego de Almagro).

The strategies, for their part, consisted of actions aimed mainly at the collection of clothes, food, medication and other useful items for health and wellbeing in order to survive outside their homes, such as tents. These strategies were carried out during the emergency, once everyone had been evacuated and relocated to a safe place, the family decides that one of the members (usually a man) returns to the house to collect more essential items.

“I was already more cautious, because I went, I packed clothes for the children, I got medicines, necessary things... in case I was going to need them, those things I threw in” (Woman, 35 years old, Chañaral).

To a lesser extent, mitigation strategies were carried out that activated different material and cognitive resources, since they were based on previously acquired knowledge from workplaces. This was the case in the construction of ditches to channel the mud and operating machinery to intervene in the flow of water in the river.

“The thing is that at six in the morning, I came to the sector here, because the river was already overflowing through the bridge; and we did a job with sandbags and... to try to channel the river, but the riverbanks burst” (Man, 49 years old, Diego de Almagro).

Furthermore, information strategies were observed, where it was decided that someone in the family was in charge of keeping up to date with reports from the authorities or firefighters, activating social networks, charging cell phones to keep telecommunication with distant relatives and friends active, or going to seek information directly from the local authority.

Finally, individuals and families also deployed strategies aimed at the safekeeping of goods (placing things high up so that they did not get wet; taking belongings to a safe place) and evacuation (preparing a way to get up to the roof of the house; bringing food, clothes, and pets to places of shelter, for example). It is worth highlighting the complications involved in evacuating sick or immobilized family members. In one particular case, the evacuation strategy consisted of building a “makeshift” stretcher with homemade materials.

“... there were some trusses, which are wood to put on the roof floating around, I caught them and put them on top of this; as he was a furniture maker he had some sponge foam they used for upholstering; and he came... and I put those sponges on top of that and told him “in case of any emergency, we are going to catch him with the stretcher, with the stretcher mat and we are going to bring him and put him here” (Woman, 46 years old, Diego de Almagro).

Regarding the actions, both tactical and strategic, carried out during the emergency, it should be noted that crisis response tactics are observed with a spontaneous distribution of roles, where some family members, generally women, are left in charge of care of children while others search for a safe place to take refuge or gather supplies.

“Yes, so we stayed there, and then my husband still went down because we had nothing to eat, another person took things and we couldn’t get anything out, so he went down to see what could be recovered from the house.” (Woman, 35 years old, Diego de Almagro).

In all of these responses to the disaster, decision-making was planned only in a rudimentary way and was mainly limited to helping those who had not evacuated and keeping in check the feelings of anxiety and a lack of control they or others were experiencing.

All these actions were complementary, there were no family tactics and other strategies, but tactical actions outnumbered strategic ones.

### After the Emergency

A first group of actions observed are strategic and oriented to the State. However, these are not perceived as part of a structure of opportunities, as suggested in the AVEO analysis model, since they are characterized by being highly critical and accompanied by discomfort. These “demand strategies” point to the requirement of an efficient operation of the State in relation to the post-emergency situation (providing shelter, delivery of benefits and food), all these provisions are considered to be the responsibility of the State and therefore, they do not put pressure on finding new responses to adapt to the disaster, other than those expected from an efficient State in its functions. The level of planning involved in these actions is low but the long-term goal is a definitive solution to the problems that put survival at risk. The activated resources are mainly subjective: expressions of anger and moral resources, such as the demand for rights.

“... and I fought with the governor, I told him ‘My mother owns her land, she owns her house, her house, with the title and they never got the money to buy a house, instead...’ I said, ‘see why don’t you look for the names?’ So here the one who should coordinate well is the governor and the mayor” (Woman, 48 years old, Chañaral).

Examples of these strategies are: “fighting” with the provincial authority due to not receiving help, requesting aid for goods from the municipal authority (which was received 5 months after the emergency, according to testimonies); protesting collectively;

making complaints; asking the mayor for help for neighbors more adversely affected than themselves.

To a lesser extent, cognitive resources were activated, related to knowledge about risk management. Such is the case in the action of suggesting to regional authorities’ strategies to distribute aid according to real needs, also suggesting the use of a specific management instrument (map) that would serve this purpose.

“After this I said ‘mayor’ I said ‘you have a map’, because here help was given to many people who did not lose anything, ‘you have a map, see Salado Street, lead’” (Woman, 48 years, Chañaral).

In each example of interactions with authorities, the subjects’ objectives were focused on restitution of citizens’ rights rather than merely obtaining specific benefits.

A second group of actions, also strategic, here called “system integration strategies” were actions that made use of state benefits, such as: filling out information for registers for shelters (high schools, emergency accommodation) and attending meetings to get information. They are actions that take time and are valued as necessities rather than as guarantees of safety. Registered in the system allowed access to information about the distribution and conditions of benefits (such as emergency housing, goods, food, medicine, ice to keep medicine, contracts for street cleaning).

“So we had done everything as it was, we handed it over to the authorities and they didn’t use them at all” (Woman, 46 years old, Diego de Almagro).

With these actions the opportunity structure was expanded. The private world appeared together with the State: the chamber of commerce, the group of merchants and the authorities of neighboring localities assisted with problem solving (for example, installation of chemical toilets) through the use of tools, machinery, water supply and use of spaces for work.

“I was able to contact the mayor of Caldera via satellite phone (...) After 4 days it was. And I talked to her, and she sent me the first water truck; I don’t know how they got to the top, but they arrived with their water truck, which we lowered into the back sector of the town.” (Man, 47 years old, Diego de Almagro).

In addition, “empowerment strategies” were formulated, which included individual or collective actions aimed at helping those most in need. Mainly devised by people who assumed social leadership roles, they were characterized by organization in order to benefit others, with some individuals even prioritizing others needs over those of their own families. Social resources were activated, and their meaning is something other than solidarity, since they were based on the need to guarantee “that things got done” when they were not being carried out by the relevant organizations.

“... later he organized himself to go talk to the mayor, to see if he was going to ask for help, what was he going to do, we organized ourselves, we stayed until the end, we left everything aside, but

the important thing was to help, that he was more in need than us” (Woman, 54 years old, Diego de Almagro).

With lower levels of planning and with less rational objectives, there were tactics such as: (a) restoration of daily life (cleaning of streets and public spaces) that also involved collective organization among neighbors, and (b) actions of solidarity refers problems derived of emergency. This activated two subjective assets: social resources (ability to coordinate and work in a team) and cognitive resources (interpretation of information), mitigating possible problems derived of the contradictions in the information delivered by different levels of local administration.

“I had nowhere to go,” and that’s where I took the lead in the population, because the mayor had no idea what to do. Later the governor arrived, and I met the authorities there, because I didn’t even know who the mayor was here” (Woman, 46 years old, Diego de Almagro).

The objectives of these tactics were mainly related to autonomy (“taking the lead”, “getting by on our own”, “getting ahead through our own work”) and the protection of children and elderly people.

## CONCLUSIONS

In the actions, prior to, during and after the critical event, it has been identified that people maintain the ways of responding that have been studied in people with socioeconomic vulnerabilities (Arteaga and Pérez, 2011). That is assets that were mainly cognitive (knowledge), social (communication) and economic. The latter was used above all in the moments prior to the critical event, a situation that highlights the inequality in the distribution of strategies and tactics according to people’s purchasing power. Evidence of the socioeconomic gap in situations of socio-natural crisis. Knowledge appears as a cognitive resource since it supposes a conscious handling by the individual over the object. However, local knowledge comes into play in crisis situations, that is knowledge as a product of one’s own experience or that of others. This knowledge can be implicit and collective and deal not only with objects but also with processes of vulnerabilities associated with pre-existing social risks, which activates social resources that are based on cultural learning.

On the other hand, it is observed that the resources were mobilized together, intermingled, with no clear difference between the cognitive and the affective, which is why we could call them, for the most part, “subjective resources”. When mobilizing these resources together, a complex situation occurs, since it can lead to overlaps that are more difficult to orient toward a structure of opportunities that is disjointed.

According to the factors analyzed, in situations of socio-natural crisis, it is important to manage emotions as a resource for action, such as negative ones and anxiety, as well as positive ones, such as empathy, trust and compassion to support others. This allows for actions which respond more effectively to the

crisis. Knowing when to act, knowing who to collaborate with, knowing how to handle emotions, knowing how to prioritize alternatives (whether or not to save a pet if your own life is at risk) is different from knowing where to evacuate to. Knowledge -as a cognitive resource-, although necessary, is not sufficient in times of crisis; “subjective resources” become key to providing a pertinent response and carrying out appropriate actions in such contexts.

Most of the responses were poorly planned, both before, during and after the flood, a spontaneous level of planning prevails. This would show the presence of a risk individualization process (Straub, 2021). The fact that they had little scope to plan refers, in part, to the fact that only immediate and family resources are visible in moments of unexpected crisis. This made them not very adaptive, especially with regard to evacuation and mitigation actions, which could lead to becoming more resilient due to preparedness strategies since they have knowledge and resources that can be activated in advance. To strengthen strategic actions over tactics, prior support is needed aimed at making the greatest possible variety of resources visible and distinguishing all the components of the opportunities structure present in the locality.

Regarding the structure of opportunities (Kaztman, 2005), it was found that it varied throughout the risk cycle. The State was seen by people as an opportunity for support after the critical event and not for prevention. State-oriented strategies are accompanied by discomfort and criticism on the part of the population, diminishing its role and its coordinated action with the population.

On the other hand, although before the critical event the market was fundamentally used, at the moment of the response, important decisions such as where to take refuge and when to do it, were based on the sense of union, family protection, restitution of rights, solidarity and autonomy, mainly taking into account economic, material and emotional assets. In the response phase, that is, during the critical event, knowledge or other social networks were not activated, nor were the State or the market frequently visible in the structure of social opportunities.

It is possible to ask the question whether this type of response can be planned or taught with a view to better disaster risk reduction management.

In particular, it is concluded that the way of learning actions includes family and cultural habits, daily learning and previous experiences, and imitation, among others. For example, in the case of learning by imitation, especially in such key decisions as which evacuation route to use or when to evacuate, action is taken according to what is happening around at that moment or by the memory of actions carried out at some other point in time or similar situation, based on individual risk management. There was no planning or information here either, but rather a cultural matrix that gave spontaneous meaning to actions for individual confrontation aimed at autonomous family protection.

Following action guidelines by imitation and with a sense of autonomy is only useful if the crisis situations are similar to what has been previously trained and prepared for. When the critical event is different from what is expected, as in the case of the studied locations, many action plans may

not be considered significant or important to carry out. Those resources that are distinguished as controllable from meanings that are present in the social experience prior to the disaster (such as restoring citizen rights or autonomy) seem more useful to people, as well as the components of the structure of opportunities that are made visible by individuals and families as more reliable or predictable for that particular culture.

In order to project the development of actions and policies aimed at better preparation, response and recovery from socio-natural disasters, it is therefore advisable to intervene in the previous processes of individualization of risk management based on the cultural bases of the relationship with the State, the market and the society. Furthermore, the marked orientation observed in people's actions toward union and family protection, suggests that policies have to consider this social unit as a minimum level of management, both for education and for the distribution of benefits. At the same time, policies must include educational strategies that are based on the ways of acting already shown by the communities.

For further research we recommend to focus on subjective resources which were identified to cope with disasters at the individual level. However, these resources are based on family and social components that in this study were not studied in depth and that may be key to improve risk individualization. Therefore, it is suggested to incorporate methodological strategies as observation and focus groups, to understand the actions during the entire cycle of a disaster.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

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## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Comité de Ética de Investigación de la Facultad de Ciencias Sociales, Universidad de Chile. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

SP: substantial contributions to the conception, analysis or interpretation of data for the work, drafting the work, provide approval for publication of the content, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. PA, FF-H, and DM: substantial contributions to the conception, analysis or interpretation of data for the work, and drafting the work. CC and KW: substantial contributions to the conception and drafting the work. All authors contributed to the article and approved the submitted version.

## FUNDING

This publication received the support of and is a contribution to the Center for Climate and Resilience Research CR2 Fondo de Financiamiento de Centros de Investigación en Áreas Prioritarias (FONDAP) (Grant Number: ANID/FONDAP 15110009) and The Academic Productivity Support Program, PROA VID 2017, University of Chile N° A014-2017.

## ACKNOWLEDGMENTS

We thank those who participated in the interviews for their generosity and willingness to share their experiences and suffering despite the pain they were experiencing.

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