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# Unveiling hydrosocial dynamics: discourse and power in Peña Blanca

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Water is not just a material element but a socio-natural object of knowledge whose conceptualisation, policing and management carry symbolic and material implications. This issue becomes especially evident in territories where water scarcity and drought pose heightened social and environmental challenges, not least in the face of climate change. Against this background, our research looks at the long history of water privatisation in Chile and at how it has profoundly impacted water scarcity issues, exacerbated desertification, and led to water conflicts. In particular, in Peña Blanca, an agricultural community in northern Chile, these dimensions intertwine and shed light on the territory's hydrosocial components. Water and fog tell histories of social dynamics, conflicts, cooperation, and climate change. Taking a discursive approach to ethnographic fieldwork, the paper will analyse interviews carried out with local actors against the background of on-site observation to explore the discursive construction of water and its sociopolitical consequences in Peña Blanca. The paper aims to provide an original perspective on the symbolic and material implications of hydrosocial identities in climate-exposed communities struggling for autonomy, agency, and self-determination.

## KEYWORDS

water, hydrosocial cycle, Peña Blanca, drought, framing

## 1 Introduction

Hydrosocial relations are socio-natural entanglements and processes embedded within power relations. Beyond modern and rationalist conceptions of water as a resource to be exploited, water relations are conflict-ridden spaces within which struggles over power, recognition, and knowledge occur. Water, thus, becomes a means of emancipation and empowerment for human and non-human actors. Hydrosocial territories (Linton and Budds, 2014) are, in fact, co-constructed spaces of contestation in which the social and natural dimensions of water co-emerge. As Boelens and colleagues describe, hydrosocial territories are political spaces shaped by competing socio-natural ideas created through the dynamic interactions of different actors who both cooperate and compete over the way the world should be (2023). This idea becomes apparent in contexts experiencing water scarcity where the impacts of natural and anthropogenic scarcity bear on the most marginalised and vulnerabilised communities. In these contexts, moving beyond rationalist water management and reclaiming water governance has the power to revive community cohesion, implement bottom-up practices grounded on traditional hydrological knowledge and challenge top-down imposed water management practices.

Against this background, the Chilean case provides an exemplary case of how poor water management under neoliberal governmentality works to depoliticise water

management, marginalise the community and disrupt hydrosocial relations. As we will discuss more in-depth later, the Pinochet dictatorship and the neoliberal framework devised in concert with the Chicago Boys have vulnerabilised communities, separating land ownership and water rights, putting them in the hands of market mechanisms. This technocratic water management model has crucially disempowered local communities whose practices relied on local knowledge and a relational form of management (Boelens et al., 2023; Linton and Budds, 2014) (Budds, 2013) (Blanco et al., 2023) (Di Tullio, 2023) (Krzyżanowski, 2017).

In order to analyse how hydrosocial relations play out in contexts struggling with water scarcity, we focus on the Peña Blanca agricultural community in Northern Chile. *Comuneros*<sup>1</sup> in Peña Blanca fundamentally rely on their territory hydrosocial cycle for their subsistence and practices. Through collective ownership and self-management, *comuneros* reclaim their cultural identity and knowledge, asserting their identity and belonging against neoliberal hegemony and modern water management. Moreover, their strategies, such as using *atrapanieblas* to catch fog and turn it into drinkable water, provide a great example of ecological contribution to their area. Peña Blanca, thus, provides a great example of how material and symbolic practices are intertwined in challenging institutionalised management and neoliberal discourses around water relations.

For these reasons, the paper will address how hydrosocial relations among Peña Blanca *comuneros* are discursively constructed against the background of their cultural practices. To do so, we will apply a multidisciplinary framework theoretically grounded in Critical Discourse Studies (Wodak and Meyer, 2015) and Anthropology to the analysis of a corpus of interviews collected by Author during her ethnographic work between November 2021 and January 2022. Analytically, the paper will devise a mixed-method approach drawn on Corpus-assisted discourse studies (Partington et al., 2013) and Ethnographic fieldwork to analyse how hydrosocial relations are discursively framed among the *comuneros*. Framing here refers to a paradigm devised by Entman (1993) that allows to understand how language highlights certain aspects of social reality in order to shape how information are interpreted. In allowing the analyst to address the way issues are framed along with the function these frames fulfil, frame analysis will allow us to investigate whether and how the community of Peña Blanca defines water relations and challenges top-down, rationalist and depoliticised narratives on water management. In so doing, we will try to answer the following research question:

- How are hydrosocial relations framed among Peña Blanca *comuneros*?

To answer this question, the paper will first address what we mean when we talk about water and hydrosocial relations. Then, in the second section of the literature review, we will focus on the role and impact of privatisation and the 1981 water code on water scarcity in Chile, along with other natural and anthropogenic factors. Section 1 will close with a description of the context of our study and its relevance to the research on water and hydrosocial relations. Section 2 will describe the Peña Blanca water corpus (PBWC) and address our analytical standpoint and why its interdisciplinary nature can improve our understanding of the results. Section 3 will present the results. First, we will describe the results of the corpus-assisted analysis and then move to a more qualitative discussion of our observation, drawing on field observations made by Author while in Chile. The results will also attempt to discuss the relevance of the research to our research question.

## 2 Water and hydrosocial relations

Water is a fundamental dimension of life that intersects with symbolic, social, political and cultural meanings. Social sciences have largely explored this multifaceted nature, examining water's sociocultural implications and role in knowledge production and meaning-making. For instance, Van Aken (2012) investigation of how communities perceive, use, and govern water highlights the different meanings water can assume based on cultural contexts. In some societies, it is seen as a sacred and symbolic resource; in others, it is a commercial good or a source of conflict. Van Aken's analysis shows how this diversity influences how water is managed, distributed, or shared and how local and global politics contrast communities' traditions and needs, generating tensions for water access and use. Embracing this perspective challenges the conventional perception of water as a mechanical formula and underscores its potential to reveal contradictions, conflicts, and networks, thereby exposing the myopic Western contemporary perception of it.

Along these lines, Illich (1985) argues that Western rational thought has obscured this multidimensionality. In particular, Illich's account discusses how modernity has altered our relationship with water, obliterating its symbol meaning and reducing it into a pure functionalist entity. In its modern form (H<sub>2</sub>O), water represents a product of scientific rationality and technocracy, purified, measured, and made neutral. Deprived of its complexity and connection to the natural and human worlds, water came to be perceived as "the stuff which radiates purity" (Illich, 1985, 75) on which human survival depends.

For those who have access to it, having running tap water as a usable, accessible, predictable, and uncontaminated resource conceals the sociocultural processes involved in water cycles, distribution, and technical control. Water as the "stuff" highlights how hydraulic-bureaucratic and capitalist development intertwine with rationalist imaginaries of managing waters and humans (Ballester, 2019). In this sense, calculations' instruments and methods (such as water tariffs and monitoring systems) shape water perceptions as common goods, human rights or commodities, intertwining with political and moral values.

<sup>1</sup> The *Comuneros* are the land owners of Peña Blanca. The name *comuneros* refers to the idea of common property, legally owned by the community itself and fragmented and distributed between the families of the pueblo, namely, the *comuneros*.

Also, as Ballesterio highlights, governments and organisations project the future through water management, generating tensions between water's perceptions as a human right, economic resource, and cultural symbol. These tensions partly arise because water is deeply connected to social identities shaped by its interaction, management, and protection, which influence the construction of a sense of belonging and community. Concepts such as hydrosocial cycles (Linton and Budds, 2014), waterscapes (Acharya, 2015), and waterworlds (Hastrup, 2009) emerged to describe the interconnections between water, societies and power. These concepts go beyond the strictly natural idea of the hydrological cycle (evaporation, condensation, precipitation, etc.) and consider the role of human societies in shaping the flow, distribution and access to water.

Hydrosocial territories incorporate hydric infrastructures, norms, cultural practices, and conflicts over who controls and manages water. They are negotiated and contested, especially when constructing or implementing specific infrastructures (dams, mines, pipelines, etc.). They often represent power inequalities showing who is marginalised or excluded from water access and who, instead, is favoured, such as industrial or urban use over rural distribution and water security (Boelens et al., 2023).

In conclusion, water systems actively co-produce hydrosocial territories that embody worldviews, knowledge frames, cultural patterns, and power relationships. They constitute "political geographies of contested socio-natural imagination, configuration, and materialisation: dynamically produced among divergent actors in different locations who collaborate and compete over the world that-is and that-should-be" (Boelens et al., 2023, 1135). This dynamic approach to hydrosocial territories shows how the rationalist hydrologic cycle represents water that arose within a specific historical context to serve a particular political project and how crucial it is to shift to a multidimensional approach in governance, highlighting how and to what extent water interacts with other social actors (Linton and Budds, 2014). This perspective gives insight into who designs, controls, and has the power to produce what kind of hydro-social territory, suggesting a more critical approach to framing water politics and practices.

## 2.1 Water privatisation and scarcity production

Applying this framework of socio-hydrological relations to contexts suffering from water shortages reveals the extent to which multiple social and ecological factors produce this scarcity, impacting agriculture, health, the environment, and the economy (Liu et al., 2017). Approximately 2.2 billion people worldwide lack access to safely managed drinking water services. An estimated 8 billion people experience severe water scarcity for at least part of the year due to climatic and non-climatic factors. Almost half a billion people live in low-water areas, where the long-term average rainfall is only as high as 1 year out of six (Caretta and Mukherji, 2022). The consequences of the observed changes in the hydrological cycle on people and ecosystems are increasingly evident, and many of these impacts are negative and disproportionately felt by already vulnerable communities.

While "water scarcity" is a common term, it has different meanings in various contexts. For this paper, the crucial differentiation is between physical water scarcity, such as in the desert, and "use scarcity," understood as a problem of access and management (Molden, 2019). As Baer (2014) points out, scarcity is a highly political dimension in Latin America—as in other countries where third-party development projects intervene. In Latin America, these two dimensions of water scarcity are deeply intertwined, giving space for several phenomena of extreme drought. In other words, the causes of drought are, on the one hand, climate change (increased temperatures and variability in rainfall), deforestation (the removal of forests and prolonged agriculture reduce soil capacity to retain water), unsustainable water use (excessive withdrawals from rivers, lakes, and aquifers for agricultural irrigation, industry, and domestic use), decreasing rainfall, and the drying up of local aquifers (Liu et al., 2017).

On the other hand, as Molden (2019) reminds us, the root cause of scarcity is how water is managed: "There is no scarcity of water, only a scarcity of management" (Molden, 2019, 258). In other words, scarcity arises from the management system, where access to water and distribution reveal social segmentation and relations of inequality (Van Aken, 2012; Blanco et al., 2023). Therefore, poor management creates a mechanism of scarcity production, often supported by environmental rhetoric that obscures the social, political, and management dimensions generating it.

Political and managerial reasons do not deny that water scarcity is also an environmental issue caused by changing climatic conditions. However, it entails an additional level of complexity that does not settle for politically neutral ecological reasons. In this context, the hydrosocial framework unveils the biological, historical, political and cultural interconnections related to water scarcity, management and practices. Moreover, this framework highlights how water rights, principles, and authorities coexist and interact in the same arena and how hydrological knowledge is produced and used in policy (Budds, 2013).

Chile is facing one of the worst droughts in its recent history, with some regions experiencing significant reductions in rainfall since 2010 (Garreaud et al., 2019). As elsewhere, climate change is altering precipitation patterns, leading to prolonged periods of drought. The El Niño period also contributes to this, leading to drier-than-normal conditions. In addition, inadequate management of water resources, including intensive use for agriculture and mining, has also contributed. The impacts of drought have already damaged agriculture and crops, provoked drinking water shortages, increased desertification and soil degradation, generated stress on ecosystems and loss of biodiversity, and stress on communities and social systems (Errázuriz, 2014).

During the Augusto Pinochet dictatorship, Chile introduced the Water Code (*Código de Aguas*), one of the most radical reforms in water management. The government selected a series of civilians as consultants, including a group of economists known as the Chicago Boys, who had studied economics at the University of Chicago under the guidance of Milton Friedman, one of the leading exponents of neoliberal thought. Upon returning, they assumed government positions in Chile, promoting widespread deregulation, market liberalisation, privatisation, and State retrenchment in areas such as water systems, electricity, and healthcare.

In particular, the 1981 Water Code focused on privatising water rights, allowing them to be bought and sold on the open market (Bauer, 1998). Water rights were separated from land ownership and granted indefinitely (Errázuriz, 2014) and for free, facilitating ownership to individuals and companies. This reform aimed to promote efficiency and optimal allocation of water resources through market mechanisms. In markets, prices facilitate the measurement and comparison of different goods by coordinating dispersed information about supply and demand. These are some significant advantages of market mechanisms over central state planning (Bauer, 1998). In this way, water rights became tradable assets, creating what Robbins (2012) defined as a model of “apolitical ecology.” The idea was that water distribution would be managed through the free market to ensure neutrality concerning political influences. However, this approach has turned water into a field of conflict: available to all who can afford it but hardly accessible to the most disadvantaged social strata. In the context of increasing water scarcity, the economic value of water is raised and made the centre of political and environmental conflicts (Bauer, 1998; Larrain and Schaeffer, 2010).

Budds highlights that neoliberal thinking and the perception of water as “the stuff” (Illich, 1985) lead to a technocratic approach to political management, where technical experts develop and direct policies. The techno-scientific attitude emerges as a driving force behind bureaucracy, serving as a crucial tool for control and administration. It creates a readable and mappable reality, cleaning off the confusion of the natural world (Budds, 2013). The market’s use for claiming resources, access, and territorial transformation has radicalised economic models of domination instead of serving as an emancipatory instrument. Consequently, it has increased unequal access to water and amplified user conflicts and negative environmental impacts. However, technocracy is continually challenged by local practices enacted by social actors to generate alternative, localised, relational, and experience-based knowledge spaces instead of relying solely on techno-scientific notions.

In conclusion, the Water Code of 1981 delegated administrative authority regarding water resources from the State to transnational private corporations. Water was dematerialised and abstracted from social and physical contexts to be transformed into an invisible, tradeable and regulatable commodity. The rural population has experienced, and continues to experience, the most significant repercussions of this water system. In this regard, while water is acknowledged as an inalienable human right and a public resource in the rest of the world (which does not guarantee uniform access for all population segments), in Chile, it is a mere commercial good circulating in the market. According to Santoro et al., this fact constitutes an “assault on life and human rights” (Santoro et al., 2018, 172, my translation).

## 2.2 The agricultural community of Peña Blanca

This work is based on ethnographic fieldwork conducted by the author in Peña Blanca, a *pueblo* in northern Chile. The ethnography aimed to investigate the social implications of drought and fog catchers on the community. Peña Blanca is an Agricultural

Community of 85 owners (called *comuneros*). Agricultural Communities are legal forms of unique ownership in Chile, governed by Law No. 19.233 of Decree No. 2 of 1968, which allows for joint ownership of land, i.e., property shared between several people. Legally, the owner of the land in the geographical area of Peña Blanca is the entire community. The number of *comuneros* was decided in 1978 when the community was formally established, and it cannot be increased or decreased. A *comunero* does not own the land itself, but the right of ownership (*titulo de propiedad*), which is the right to be a *comunero*. Each family may choose only one *comunero* as a legal representative within the group unless more property rights are acquired on different lands. A *comunero* can sell his property right to others – of the community or external. However, he cannot sell fragmented pieces of his land; he only sells the right to become a *comunero* and inherit a specific area of land. Such a norm allows the community to keep the number of *comuneros* stable and forbids fragmenting one’s land to sell different parts to different people. Thus, by selling one’s right to be a *comunero*, one loses the material good that corresponds to the land owned and the social right to be an official part of the community. In this sense, selling the right to be a *comunero* means losing part of one’s identity.

Therefore, even if the land in Peña Blanca is common property, each *comunero* has the right to own a plot where their house (or more houses, depending on the number of family members) and domestic gardens are typically built. In addition to this, each *comunero* rents multiple plots from the community to cultivate grain, animal pasture, or other plants. These rented areas are called *lluvias*. Today, the *lluvias* are mainly transit land since, after the drought, it has been impossible to cultivate them extensively. Consequently, most *lluvias* today are unrecognisable from individual or shared lands because they are neither fenced nor used. Indeed, the fact that they are called *lluvias* (literally “rain”) brings to light the deep dependence of this valley on rainwater, which is used as the primary irrigation method for cultivation.

Finally, the remaining lands are the common lands that, before the 2000s and the mega-drought, were used mainly for the collective cultivation of wheat and grazing cattle (Errázuriz, 2014). These collective practices were also profoundly intertwined with the community’s social and cultural life<sup>2</sup>. Thus, when the soil gradually dried out, it also radically changed the community’s life. In 20 years, within a single generation, the common lands became uncultivated, the soil dried, and the process of desertification expanded. This phenomenon today is locally referred to as the *mega-sequia* – the mega-drought. The area of Peña Blanca has always been affected by cyclical droughts; every two or 3 years, the so-called good

2 The central practice was the *trilla*, during which the grain was placed on a round concrete surface, and a group of horses trampled the grain to separate the seeds from the stalks. This was followed by the *venta*, a system that utilised the wind to clean the grain of earth and dirt. Families shared resources such as horses or food during these events. Therefore, the socio-cultural practices that developed around the collective harvesting of wheat contributed to strengthening bonds of solidarity and intergenerational connections and knowledge. For more details, refer to Di Tullio, 2023.

and bad years alternate. Rainfall tended to be inconsistent, typically concentrated in the winter months, but there were entire seasons with very little or no rain (Alexander, 2006).

Nevertheless, the community was used to it: they had systems for collecting rainwater and usually moved with the animals towards greener areas during bad years. Indeed, the documentation showcases varying productive strategies and cultural practices shaped by the community structure amid significant differences in the availability of environmental, human, and capital resources. The difference between these drought cycles and the mega-drought is that the latter refers to a continuous and drastic decrease in the pluviometry measured over the last 20 years. In addition, due to the scarcity of rainfall and centuries of extensive use, the soil is becoming less fertile, and desertification is progressing (Errázuriz, 2014).

The gradual decrease in rainfall led to the loss of surface water and negatively impacted soil fertility. This water scarcity had several economic and cultural impacts on the community. The first to disappear was the widespread cultivation of wheat and the extensive use of the *lluvias*. Subsequently, raising livestock, particularly horses and cows, became uncommon. For instance, some farmers had thousands of grazing animals before the mega-drought, whereas today, they have hundreds, if not fewer. Despite the significant water scarcity and arid soils in Peña Blanca, there is still access to potable water.

Nevertheless, faced with economic pressure, many young people have migrated to urban areas in search of employment and a better quality of life. These aspects are essential for understanding the community's present situation. It is well-known that agricultural communities in Chile are economically and politically marginalised territories (Errázuriz, 2014). Despite these precarious conditions, the community received no support from national politics.

In 2005, the then president of the Peña Blanca community, together with Nicholas Errázuriz, founder of the FUAD (Fundación un Alto en el Desierto), a local NGO, developed an innovative project to counteract the forces of desertification and land degradation. They aimed to implement an adaptive strategy by recovering a portion of water from the frequent coastal fog (also called *Camanchaca*) that was highly present in the area. For this purpose, they developed a project called *Atrapanieblas Comuneros*. *Atrapanieblas* (or fog catchers) are simple structures with horizontal polypropylene nets (the most common is the Rachel 35%) perpendicular to the ground, supported by two lateral poles and in alignment with the prevailing wind direction. These nets 'trap' the fog that flows through their meshes. The fog, then, condenses and, due to gravity, slips down the net's threads, ultimately collecting in barrels of various sizes via a piping system (Castelli et al., 2023). Over 15 years, through trial and error, the *comuneros* and FUAD managed to configure the infrastructure to its current state. When there is a significant amount of fog and wind, the water flow through the pipes is impressive, creating streams and eddies that flow at great speed, collecting in a 60,000 L pool. As of 2021, Peña Blanca had 28 meshes used for irrigation and animals' drinking. The water collected in a year was around 571,590 L (meaning 2,190 L/m<sup>2</sup> and 60 L/m<sup>2</sup>/day).

The project's name was thought to represent the idea of a bottom-up project conceived, made and maintained in collaboration with the *comuneros* of Peña Blanca. Peña Blanca is

TABLE 1 The Peña Blanca water corpus.

Corpus data	Peña Blanca water corpus
Tokens	85,209
Words	73,474
Sentences	681
Interviews	19

situated between Chile's coast and the Andes, in a territory characterised by hills. At the beginning of the project, they noticed that the area with the highest and most constant presence of fog was the tallest hill (650 m), called the Cerro Grande. The *atrapanieblas* were built there. As we have seen, the land is mostly collectively owned, which means that even the project of the *Atrapanieblas Comuneros* had to go through the assembly and the *comuneros*, voted by the majority. Those who accepted the project won by very few votes, reflecting a deeply divided reality within the community and bringing different interests to light. The Cerro Grande was then turned into an ecological reserve, a protected area enclosed by a fence to keep the grazing animals out. The collected fog water was used mainly for reforesting the protected area and, in part, to fill a tank outside the area so that animals could drink water.

In conclusion, it is worth mentioning that the *atrapanieblas* serve as affordable and sustainable infrastructure. Some of the families of Peña Blanca have played a crucial role in constructing and maintaining these structures since the beginning. Moreover, in the project's first stage, they self-organised to gather scientific data on fog and wind conditions, including type, velocity, and frequency, by constantly visiting the Cerro Grande (Di Tullio, 2023). Recently, thanks to the ongoing collaboration with the FUAD and the interest of the Ovalle municipality, they instituted a paid position in the community that takes care of the ecological reserve and its *atrapanieblas*.

## 3 Materials and methods

### 3.1 Data

The paper is based on the analysis of the Peña Blanca Water Corpus (PBWC) – a corpus<sup>3</sup> of interviews carried out among the Peña Blanca Community by Author. The corpus is constituted of 19 interviews carried out in a period of 2 months between November 2021 and January 2022. There were 23 interlocutors interviewed, and the interviews took place in their own houses. The interlocutors were chosen based on age, gender, location of their home, social strata, and profession to obtain a wide range of data. Moreover, as

<sup>3</sup> A corpus is defined within corpus linguistic as a "representative samples of a particular type of naturally occurring language" (Baker, 2023, 2) electronically encoded in order to explore textual and discursive patterns through a software.

most of the population uses a dialect specific to the area, the Author conducted the interviews together with a member of the community - typically referred to as the primary or key informant in classic anthropological works (Weingrod, 2004). The corpus analysed in this paper was part of a broader ethnographic research to identify the connection between water scarcity, climate change and the social consequences in the Peña Blanca community. During the ethnographic fieldwork, two main strategies for qualitative analysis were used: participant observation and unstructured (or in-depth) interviews. However, given the multidisciplinary nature of this paper, which gives space to linguistic analysis, we will focus mainly on the interviews as primary data. For the interviews, the questions were related to three specific issues regarding water scarcity and the link with political and hydrological causes, the *Atrapanieblas Comunerros* project, and the changes in the community life caused by the drought. The interviews were manually transcribed verbatim. Table 1. summarises the corpus structure.

### 3.2 Methodology

The paper will address how hydrosocial relations are discursively framed in the corpus, drawing on a multidisciplinary framework grounded on critical corpus-assisted discourse studies and anthropology.

Critical discourse studies is a problem-oriented approach that sees language as a social practice that is conditioned and, in turn, influences social structures carrying fundamental ideological underpinnings (Wodak and Meyer, 2015). Ideology, power, and context are the bedrock of such an approach and allow for a situated investigation of how language reproduces or challenges power structures.

Ethnographic practice is conventionally understood as a central component of anthropological inquiry (McGranahan, 2018)<sup>4</sup>, mainly defined by long-term participant observation. Participant observation is an inductive, open-ended method for studying what is significant to the community regarding specific issues. In this sense, ethnographic practice requires *in-situ* observation to describe the practices, discourses, and relationships surrounding specific issues (Ingold, 2008). The ethnographer interacts with the people involved and critically reflects on how her position is part of and influences the relationships established in the field (Elie, 2006).

One of the methods used by ethnographers is the interviews, which can be structured, semi-structured or unstructured. For this

paper, we draw mainly on unstructured interview analysis to allow for linguistic analysis of the issue of interest. Unstructured interviews are used to guide the interlocutors' responses and reactions as little as possible. The aim is to determine what is significant to the community and what they notice as crucial in the research context (Burgess, 1993). In this sense, even if the topic is suggested, the interview has open-ended questions on themes, and it is conducted more as a conversation, letting unexpected interconnections emerge. A particular form of unstructured interview used in the context of this research by the Author is the so-called life stories. This form of interview allows us to understand how some people perceive, react to and contribute to changes that affect and influence their lives as individuals and as members of a group or broader community. Therefore, practices, relations, narratives, and personal biographies are all significant data sources for ethnographic research (Krauß and Bremer, 2020).

Critical discursive approaches to ethnographic research and interviews are not new. Notably, the Discourse-ethnographic approach (DEA) developed by Krzyzanowski (2017) systematised a way to actually include the context of discourse into textual analysis of linguistic patterns along with critique and analysis of power relations. The DEA considers ethnography as a complex and dynamic research process which informs the analytical process throughout all its phases (Krzyzanowski, 2017). At the same time, the growing centrality of corpus linguistics within discourse studies (Machin and Mayr, 2012; Baker, 2023) brought scholars to investigate corpora of interviews with corpus linguistics methodologies (see Curry and Pérez-Paredes, 2023 *inter alia*). For this paper, we draw in particular on corpus-assisted discourse studies, namely, "that set of studies into the form and/or function of language as communicative discourse which incorporates the use of computerised corpora in their analyses" (Partington et al., 2013, 10). This approach that combines computational, quantitative methods with qualitative observation allows searching for "non-obvious meanings" (Partington et al., 2013, 11) and, at times, leads to serendipitous discoveries in discursive patterns.

Although Critical Discourse Studies and Anthropological research are different in scope and methodology, they share an interest in naturally occurring language, its cultural connotation, and situated nature. Thus, a synergy between the two is not only possible but also necessary. For this reason, the paper will integrate quantitative corpus-assisted methods with ethnographic fieldwork observations to address how hydro-social relations are discursively framed in the aforementioned interviews.

Framing can be considered an analytical paradigm that allows analysing how speakers select certain aspects of reality by means of salience and omissions to express identity or induce certain interpretations of facts and events (Entman, 1993). According to Entman's framework, frames serve the purpose of defining problems, provide causal interpretations, produce moral judgment and recommend solutions for the problem which is discussed. Despite being mostly known for its deployment in media and communication studies for news analysis, this approach can allow us to analyse and discuss how social actors in Peña Blanca discuss the water problem against Chilean historical, cultural and social background.

To this aim, we started with a keyword analysis of the corpus. Keyword analysis is a corpus linguistics technique to investigate the saliency of words in a corpus named target against a generally more

<sup>4</sup> It is worth mentioning that Tim Ingold (2008) critiques this view, drawing a line between anthropology and ethnography as two different and independent practices. According to his understanding, anthropology is not a study of people but a study with them. It is an inquiry into the conditions and possibilities of human life, and participant observation is a way of working toward this objective. Instead, ethnography is an independent practice of description of a context conventionally associated with fieldwork and qualitative data collection. For a further discussion on this topic see Ingold, T. (2008), Anthropology is not ethnography, *Proceedings of the British Academy*, 154, 69–92.

TABLE 2 Keyword list of the PBWC.

keyword	Frequency focus	Relative frequency focus	Frequency (reference)	Relative frequency reference	LL	LR	%DIFFF
ehm	98	1333,805156	55	0,02329124	1834,2	10,95546918	99,9965076
po	285	3878,923156	2839	1,20225137	4007,6	8,079116914	99,9380303
atrapanieblas	59	803,0051447	152	0,06436851	974,52	9,431491813	99,9839694
niebla	74	1007,158995	2776	1,17557232	849,69	6,753133661	99,7668289
estanque	81	1102,430792	3636	1,53976259	901,37	6,573644589	99,7210501
anos	75	1020,769252	4181	1,77055759	802,48	6,357017272	99,6536942
trigo	102	1388,246182	7342	3,10916857	1039,7	6,101441139	99,5530734
sequía	67	911,8871982	5265	2,22960672	671,32	6,013691085	99,5121834
despues	146	1987,097477	14768	6,25390922	1389,8	5,761223555	99,3725232
pozo	76	1034,379508	9364	3,96543919	693,69	5,563940401	99,2362
acá	346	4709,148815	50916	21,561758	3036,2	5,38634117	99,0884347
tambien	197	2681,220568	30552	12,9380711	1708,2	5,33385319	99,0395465
asi	243	3307,292376	37901	16,0502041	2104,3	5,328163557	99,0340927
agua	862	11732,04127	175620	74,3710413	7007,9	5,061012311	98,7401585
teníamos	62	843,8359147	12563	5,32014231	504,72	5,06645801	98,7469577
estan	85	1156,871819	19937	8,44286215	667,31	4,920153565	98,550973
cerro	123	1674,061573	30514	12,921979	951,97	4,864078371	98,4680373
iban	51	694,1230912	12397	5,24984511	396,78	4,884450736	98,4986994
dia	111	1510,738493	28269	11,971273	853,33	4,837844014	98,4276356
ahí	369	5022,184718	96389	40,8185303	2818,2	4,812484168	98,3875764
lluvia	59	803,0051447	15328	6,49105638	451,25	4,817935833	98,3962726
dias	55	748,5641179	15362	6,5054546	412,77	4,745515868	98,2768596
mas	674	9173,313009	199189	84,3519721	4983	4,689055599	98,1776836
viento	60	816,6154014	17999	7,6221636	441,82	4,674107972	98,1504935
papa	54	734,9538612	17775	7,52730474	387,72	4,581270682	97,9723917
allá	185	2517,897488	67669	28,6562692	1289,8	4,475807263	97,7494079
animales	162	2204,861584	63756	26,9992034	1106	4,402612649	97,5805656
entonces	381	5185,507799	156003	66,0636918	2571,4	4,363003748	97,484041
plata	77	1047,989765	31927	13,5203521	517,77	4,350432986	97,4526193
arriba	75	1020,769252	33493	14,1835172	493,36	4,276231263	97,2590987
aquí	285	3878,923156	142133	60,190065	1812,8	4,165805552	96,9439789
claro	189	2572,338514	94128	39,8610487	1202,7	4,167171068	96,9480855
as	52	707,7333479	28880	12,2300175	319,76	4,058174015	96,6026001
yo	465	6328,769361	264638	112,068122	2837,1	4,033754162	96,5200761
mucha	117	1592,400033	66452	28,1408976	714,31	4,035773663	96,5269748

extensive corpus named reference corpus (see Baker, 2023 for more details). For our analysis, we compared our corpus against the Chilean domain of EsTenTen 2018, a corpus of web texts in Spanish Language from 2018.

The keywords were first computed using the Corpus Linguistics analysis software Sketch Engine (Kilgarriff et al., 2014) and then further computed in Excel to elicit keywords that were significant, highly frequent and above average in terms of difference against the

TABLE 3 Thematic coding of the keywords.

Theme	Keywords
Water	sequia, estanque, pozo, agua, lluvia
Fog	atrapanieblas, niebla, cerro, viento
past and present	años, teía, despues, iban
places and geography	alla, aca, ahi, aqui, arriba
Other	ehm, po, tambien, asi, estan, dia, dias, mas, papa, entonces, plata, clar, as, yo, mucha, trigo, animales

reference corpus. More specifically, using loglikelihood ( $\alpha = 0.0001$ ), adjusted with the Bonferroni correction method, we downsized the number of keywords to only those significant, and then we computed the average relative frequency to select only those above this average frequency. Lastly, the average of the %DIFF (Gabrielatos, 2018) was computed to keep only keywords above it. This resulted in  $n = 35$  significant, highly frequent and highly specific keywords. Table 2. shows the keyword lists.

In order to organise the keywords and proceed with the analysis, we inductively coded the keywords thematically as shown in Table 3. For the scope and purpose of this paper we will focus only on the analysis of the keywords under the *water* theme.

## 4 Results

For each interview, we analysed each answer when one or more keywords occurred, assigning a frame and a function each. We analysed a total of 284 instances, as shown in the next table. Differently from Entman's framework, we draw on Curry and Brookes (2025) in terms of the functions analysed, yet we retained the moral judgement category as it was functional to our analysis.

As Table 4. shows, most of the instances analysed carry the function of Representing Causes and Effects (105) linked to the region water-related issues answering the question "who or what is responsible for the situation?." Then, the second most frequent function is that of defining and contextualising hydro-social relations in Peña Blanca (103). Proposing solutions and moral

judgment are instead quantitatively less prominent, accounting for 52 and 24 instances, respectively. Although this interpretation is still superficial and does not go into the depth of the motivations of the social actors interviewed, these preliminary results seem to suggest that interviewees were mainly preoccupied with sharing the situated experience of water problems, how they got there, and what that entails.

In order to provide a more nuanced quantitative perspective, Table 5. will help us understand how frames relate to these functions.

Hydrosocial relations in the corpus are mostly framed in terms of water availability (79), *Atrapanieblas* (38), water governance (31), and infrastructure (24). What is particularly interesting is that these mainframes often overlap and share common subframes. This note is of particular interest to our theoretical approach as it clarifies how it is impossible to categorise how the water problem is discussed. Instead, these results confirm how water relations are inherently complex and dynamic. For example, issues linked to hydrological infrastructure, besides being a main frame itself, appear as a subframe in all the other most prominent frames used by interviewees. Such a result signals how crucial infrastructural measures are in contexts experiencing water scarcity beyond purely technical approaches. After this brief introduction, the following paragraph will address the relationship and interrelationship between frames and subframes more directly, and their function against the background laid out above.

The fact that water availability is the most frequent frame employed by social actors interviewed in Peña Blanca is not surprising. As stated above, the social, geographical and economic impacts of droughts in Peña Blanca have drastically changed community life. In particular, the issue of water availability intersects with infrastructural problems across all the functions performed by this framing activity. Indeed, poor infrastructural management defines how water relations have changed in Peña Blanca, and it is deemed to be one of the causes of scarcity. Furthermore, regarding the solutions proposed by social actors to avert water scarcity, references to infrastructure are the most prominent. Besides this issue, the water availability frame is mainly used to represent causes and, in particular, effects of scarcity and drought for Peña Blanca's community. In particular, adverse effects on mental health, community cohesion and social wellbeing.

TABLE 4 Percentage distributions of framing functions and associated frames.

Function	N	%	Frame
Defining and contextualising	103	36	Water Governance, Past and Present, infrastructure, water availability, atrapanieblas, perception of water, history, geography, social impacts, water quality, water, identity, future
Representing causes and effects	105	37	Drought, scarcity, water availability, mental health, water governance, impacts on farming and agriculture, social impacts, infrastructure, climate change, health, past and present, environmental impacts, perception of water, water quality, atrapanieblas
Proposing solutions	52	18	Atrapanieblas, atrapanieblas and conflict, community empowerment, Infrastructure, water availability, water governance, recycle, animals
Moral Judgment	24	9	Water governance and economic interests, perception of water, atrapanieblas, climate change, water relation, atrapanieblas, water quality and health, scarcity, inaction, social impacts
Total	284	100%	



TABLE 5 Frames, subframes and related functions.

Main frame	Subframe	Function	N
Agriculture and Farming		Representing causes and effects (5), Defining and contextualising	6
Atrapanieblas	Plants, conflict, fog, community, criticism, infrastructure	Defining and Contextualising (7), Moral Judgement (7), Proposing solutions (23), Representing causes and effects	38
Climate change	Drought	Representing Causes and effects (5), Moral Judgment (2)	7
Community empowerment		Proposing Solutions (6), Defining and Contextualising (1)	7
Costs		Representing Causes and Effects	1
Environmental impacts		Representing Causes and Effects	1
Future		Defining and Contextualising	1
Geography	Community Empowerment	Defining and Contextualising	1
Governance	Economic interests	Moral Judgement	1
Health		Representing causes and effects (2)	2
History	Hydrogeography, farming	Defining and Contextualising (3)	3
Identity		Defining and contextualising	1
Impacts	Drought, Community, Agriculture and farming	Representing Causes and Effects (2), Moral Judgement	3
Inaction		Moral Judgment	1
Infrastructure	Traditions and customs, impacts, privatisation, atrapanieblas, water quality	Defining and Contextualising (12), Proposing solutions (6), Moral Judgment, Representing causes and effects (5)	24
Mental Health		Representing Causes and Effects (4)	4
Past and Present		Defining and Contextualising (16), Representing causes and effects (4)	20
Perception of Water		Defining and Contextualising (7), Moral Judgment (4), Representing Causes and Effects (3)	14
Recycle	Women empowerment	Proposing Solutions (2)	2
Scarcity	Migration	Representing causes and effects (2), Moral Judgment	3
Social impacts		Representing causes and effects (3), defining and contextualising, moral judgement	4
Fog	Water	Defining and contextualising (2)	2
Water Availability	Infrastructure, Mental health, community, farming and agriculture, resources, drought, non-humans, plants, water quality, climate change, social impacts, governance, animals, landscape	Defining and contextualising (20), Proposing solutions (9), Representing Causes and Effects (50)	79
Water Governance	Privatisation, economic interests, climate change, infrastructure, community empowerment	Defining and Contextualising (19), Moral Judgment, Proposing Solutions, Representing Causes and Effects (10)	31
Water quality	Health	Defining and Contextualising (9), Moral Judgement (2), Representing causes and effects (6)	17
Water relations		Moral Judgement	1
Unsure			11
Total			284

This point is crucial in our perspective. Research across the social sciences in different contexts and domains largely agrees upon the role of neoliberal approaches in the depoliticisation and abstraction of the technical from the social. Instead, bringing these dimensions

together might allow to (re) politicise hydrosocial dynamics. This is of critical importance in the Chilean context, given the pervasiveness of neoliberal rationality after the Pinochet coup and the ensuing Water Code.

Broadening this perspective, the focus on plants, animals, landscape and non-human actors within this frame calls for bringing together the social and natural domains within a framework in which socio-natural entanglements are conceptualised as intertwined and co-productive and highly politicised. These socio-natural co-productive interactions and their importance for Peña Blanca become clear when the *Atrapanieblas* frame is taken into account. Despite being a simple infrastructure, *atrapanieblas* are crucial materially and symbolically for the community. Indeed, within the water governance frame, *atrapanieblas* appear as part of what can be considered a means for bottom-up resistance and community empowerment against the privatised and interest-driven management of water resources in the region. Within this frame, the shift hoped for above from water management to water governance takes the form of a counter-discourse by which *comuneros* reframe hydrosocial relations moving away from top-down managerial practices to bottom-up struggle and communal governance.

Similarly, the last frame, infrastructure, performs similar functions. In framing hydrosocial relations focusing on infrastructure, interviewees pointed to the inadequacy of infrastructural measures that do not meet the community's needs. As for the water governance frame, *comuneros* lamented the impacts of privatisation on traditional practices and customs as well as on water quality. At the same time, *atrapanieblas* are seen as a counter-hegemonic practice of resistance against Chile's national water management.

## 5 Discussion

This section will analyse the discursive dimension surrounding hydro-social relations in Peña Blanca. As we have argued, water is a fertile concept that unveils deeper power dynamics, conflict, social structure, hydrological knowledge, and economic interests since it is deeply embedded in socio-political relations. For these reasons, we identified the hydrosocial territories as a background concept that makes sense of all these different water dimensions and the following interviews. As a first element worth mentioning, we noticed no direct reference to climate change in the interviews. The only reference to the broader climate change and environmental crisis category emerges in the interview with the leader of the FUAD – the NGO that operates in the *atrapanieblas* project. Locally, the multidimensional crisis is always related to water and rain presence or absence.

### 5.1 Hydrosocial relations and water availability

When addressing the issue of water availability, the first data that emerges is the space-temporal dimension of water presence and scarcity. In most interviews emerges a neat division between a “before” and an “after” of the drought that consequently shaped new economies and geographies within the Peña Blanca community. It presents a narrative of the past where water presence was abundant, as well as community solidarity and ties were strong—especially regarding the collective practice of wheat

agriculture and farming—as opposed to a present of scarcity and drought.

The following excerpt from an interview with the president of Peña Blanca represents a diffuse perception of this neat temporal division.

1. [...] what happened is that the year 2000 was the last time wheat was planted. That year when wheat planting ended was like a fatality. The wheat activity could not even be finished because it died everywhere. I mean, it stopped raining [thus, suddenly] the land was drier because it had been producing wheat for 500 years since the Spanish colonisers, and there were new commercial treaties, especially with Argentina; and Argentina is an agricultural power, so not only could wheat not be planted here because there was no *water* and because the land was becoming more and more eroded, but also because there was simply no money. So, that year, people sold all the wheat, and they lost money [...]

The excerpt underscores a significant decline in water availability since 2000, which resonates with the literature's emphasis on the detrimental impacts of water scarcity. It shows a strict interrelation between the end of extensive wheat cultivation, history, soil exploitation, the international economy, and water scarcity. Accordingly, research highlights the crucial role of water availability in agricultural productivity and ecosystem health, showing how long-term water scarcity can lead to land degradation, reduced agricultural yields, and altered landscapes (Caretta and Mukherji, 2022).

Historical data indicating abundant water resources supporting centuries of wheat cultivation contrasts sharply with current conditions, where reduced rainfall has led to barren landscapes and diminished agricultural output. This aligns with findings that water scarcity can transform previously fertile regions into less productive areas (Liu et al., 2017; Ingrao et al., 2023). In Peña Blanca, the lack of rain produced a mega-drought that affected the economic and social practices of agriculture and farming. It started 20 years before, around 2000, and marked an important transition in the collective memory. It occurred within a generation and changed the face of Peña Blanca and its traditions.

The dimensional nature of drought's causes and effects becomes evident in how local practices of cultivation and livestock grazing inadvertently contributed to the desertification and soil degradation process. Peña Blanca's economy was traditionally based on extensive wheat cultivation and family-based livestock husbandry (mainly sheep, goats, and occasionally cows)<sup>5</sup>. Many local traditions

<sup>5</sup> Farming animals is a central feature of economic, cultural, and social life in Peña Blanca. It involves collective practices that also strengthen social ties. Most importantly, animals are central to cultural identity and social status. As such, the identity of the *comuneros* is categorised based on the animals on their family farm. For instance, there is a difference between *crianceros* and *huasos*. The *crianceros* identify as farmers mainly concerned with sheep and goats. The *huasos* are the Chilean cowboys, connected with cows and horses, and have a higher social status. For a broader discussion of this issue, refer to Alexander (2006).

developed around the collective seeding and harvesting of grain. These were critical annual moments when the community was reunited, solidarity ties were renovated, and families were reconciled. However, all these traditional events disappeared with the diminishing rainwater and the abandonment of collective agriculture due to soil erosion.

Therefore, with the start of the mega-drought and the abandonment of cultivation, economic pressure fell on livestock farming, at least for the first decade. While cultivating became almost impossible, families could still farm animals, buy them pasture if necessary, or migrate to the Andes in drier times. This shift reflects how communities adapt their livelihoods to changing environmental conditions (Errázuriz, 2014). However, given the water scarcity, farming animals became more complex, and the constant and rapid diminishing of grazing animals and livestock was used as a local parameter for measuring water availability. As a complementary method to the more official pluviometry calculation, i.e., the number of milliliters of water that rain annually.

The following excerpt was extracted from an interview with one of the oldest members of the Peña Blanca community. This *comuneros* has been a *criancero* all his life, and at the time of the interview, he possessed a few goats.

2. When we had *water*, we had few goats because . . . one it was because of the scarcity of *water* and the other because of pasture: as it doesn't *rain*, there is little pasture, and you have to buy it, and buying it means buying back the animal . . . is not worth it, because a sheep I think that with the pasture that they ate, all of it . . . I would be paying about four times as much.

The decrease in farming that followed the collapse of wheat cultivation highlights how water scarcity reshaped economic practices and social and geographical dynamics within Peña Blanca. As for wheat cultivation, several collective traditions, such as grazing, shearing, and transhumance, disappeared. As wells dried, rain diminished, and the number of animals decreased, families relocated closer to the central area of Peña Blanca, which has a central water distribution system (Di Tullio, 2023).

Moreover, younger generations started migrating toward urban areas for new jobs. These movements illustrate the reconfiguration of hydrosocial relations where access to water and new sources of income become defining factors in shaping livelihoods, settlement patterns and community fragmentation. The interplay between natural water systems and human responses highlights the co-production of water scarcity and adaptation, revealing how water operates as both a material resource and a powerful social actor within this context.

## 5.2 Water availability and water governance

Throughout history, agricultural communities—generally located in poor lands and drought-ravaged regions—have been perceived as the “non-capitalist Other” in contrast with the ideas of modernisation (Alexander, 2006) and as marginalised political subjects. As Alexander highlights in the public consciousness of

Chile, these communities are images of “backward rural slums” (2006: 141) with little hope of improving life. This created a dichotomic perception between the modern urban areas and the poor rural communities.

However, the division between rural living conditions and urban centres is also created by the *comuneros*, who often look at urban areas as chaotic lifestyles and are utterly ignorant of what is happening in the land. This dichotomy is also represented in interviews through different aspects of water perception such as 1) water presence—tap water in urban areas and water harvesting by wells, rain or fog in Peña Blanca, 2) water quantity—water abundance in urban areas *versus* water scarcity in rural ones and 3) water quality. The last point needs broader clarification since water quality has two main dimensions.

On the one hand, in some parts of Peña Blanca, water quality impacts the *comuneros*' wellbeing. This is because even when water is present, it is often rich in calcium and magnesium, resulting as *salobre* or brackish (Di Tullio, 2023). This water is considered heavy and has a high presence of limestone. This happens especially in Las Pajas, creating, again, new internal geographical inequalities. This dimension clearly emerges in the interview with one member of the Peña Blanca water committee.

3. [. . .] They have a very brackish water system in Las Pajas. Of course, they have a lot of water but they don't have good water. [. . .] It's not good for drinking, for irrigation [. . .] but because they don't know that this water is not good for irrigation, it's not good for the plants, they will irrigate but it's not good. It won't grow plants. If you see the difference, for example, here you have forest, pines, a lot of water . . . but go down there to Las Pajas and see . . . there's nothing!

The quality and the taste of water then contribute to creating a new perception of the hydrosocial territories and reinforcing the idea of different accesses to water and the marginalisation from central distribution systems.

On the other hand, several *comuneros* in the interviews have underlined how water in urban areas is bad because of the use of chlorine to clean and sterilise it. In the community, however, they prefer not to use chlorine because it alters the taste and quality of water. This aspect emerged in the same interview with the water committee's member.

4. No, this water is totally natural, without any kind of chemical, chlorine or anything else, why not chlorine?
5. Nobody has died from drinking contaminated water there is no such thing [. . .] the first project that came out with the drinking water came with a chlorinator and the people here didn't like the chlorine because the chlorine has a strange taste and colour. So, the people here didn't like it and decided not to chlorinate the water anymore, they decided to drink only natural water because of the taste [. . .] this is how it is here.

In this sense, water is integrated into a double framework of purity/impurity. On one side, rural water is considered impure because it is hard water and because it lacks the presence of chlorine. On the other side, however, it is urban water that represents the impure, chlorinated (and thus, not-natural) water.

According to the *comuneros*, in urban areas, people are far from the reality of water presence, extraction and distribution that they experience in their lands. Water scarcity is understood not only in terms of drought but also attributed to poor quality and the marginalisation from national water management, control, distribution and governance<sup>6</sup>.

The issue of water and governance brings attention to another theme, that of mental health, especially in terms of fear for future possibilities, anxiety and stress. The following excerpts show the interconnection between water scarcity, infrastructure, governance, and livestock. These excerpts are extracted from a second interview conducted with the president of Peña Blanca. At this time, his son was also present and participating in the conversation, offering a similar perspective, even though they represent two generations. Water scarcity isolates the older members of the population and causes precarity for the younger ones, especially those with livestock.

6. We don't have a river nearby that flows into the ground. We don't have glaciers, and we are very far from the Cordillera . . . so we practically depend on if it rains, a certain amount of water can infiltrate. If it doesn't rain . . . where does it come from? Where does the water come from? So, this causes a little bit of stress, especially for the people with animals . . . we are already seeing. . .
7. [. . .] and water causes stress, it causes anxiety, not knowing what is going to happen . . . if we are going to have water . . . if we are going to have to start cutting off drinking water. This causes anxiety, which is something that we are not used to, that we always talk about, but we see it as something far away, but now when it is getting closer [. . .] we already think that in the following years, we may not have enough water to drink. So, these things cause anxiety, they cause stress, worry. Water causes anxiety . . . not knowing, the uncertainty . . . if we are going to have water [. . .] I think the biggest concern is [. . .] we cannot do any of the other things if we don't have water, not even live here . . . not even live here if we don't have water. This is a worry, the issue of water.

The social dimension of drought, including economic and psychological effects, is vividly illustrated through personal and collective experiences within Peña Blanca hydrosocial territories. The psychological stress and anxiety about future water availability, as described in the interviews, align with literature that highlights the mental health impacts of prolonged drought (Vins et al., 2015). In this sense, effective water governance is crucial for managing scarce resources and ensuring equitable distribution. These narratives underscore how water scarcity transcends its material absence to become a force that shapes social relations, governance structures and mental health.

<sup>6</sup> Another example of this is the *camion aljibe*, a regional system of drinking water distribution. The camions are supposed to bring drinking water to the community, but, as it emerged in the fieldwork and the literature, their presence is discontinued. The *comuneros* never really know when the camion arrives and neither if it has enough water for all the families that need it.

Community efforts, such as the proposal for deep wells and collaboration with municipal authorities, exemplify the negotiation and adaptation required to manage these hydrosocial tensions. Once again, the multidimensionality of water emerges, connecting governance issues to social and psychological phenomena. This reinforces the necessity for integrated and participatory water management strategies recognising water as a key player in influencing hydrosocial relationships (Batisha, 2015).

### 5.3 Water availability and infrastructures

In Peña Blanca, several solutions were proposed by the community, resulting in two main projects. The first one was the construction of deeper wells in the area and two APRs (artisanal rural water system). The second consisted of implementing several *atrapanieblas* to capture fog and turn it into water. For the construction of wells, the *comuneros* needed money and support from the Ovalle municipality, and thus, the solution was beyond their sole autonomy. They succeeded in implementing two APRs, directed and managed by the committee of potable water, a group of *comuneros*. The committee regulates water consumption within the community, ensures payment for overconsumption, repairs the water system when broken, and tries to find grants to facilitate the existing system (Di Tullio, 2023).

The two APRs built in Peña Blanca ensured potable water and domestic distribution. Before the APRs, the community got the water from the domestic wells: each property had one. Due to the drought, the underground water levels continued to drop, and the wells dried up over time. Therefore, with the initial support from the province, the community built two deep wells, which, with pump and pipe systems, distribute water to (almost) all the houses in Peña Blanca. The other project was focused on using the high fog presence of the area as a water source for reforestation and animal drinking. The following excerpts answer the same question: what do you think about the *atrapanieblas*' implementation? The first one is extracted from an interview with two women living in the margins of Peña Blanca and the second one from a member of the FUAD - the NGO that operates in Peña Blanca.

8. S1: I think that's why I'm grateful that we have fog and that we can have *atrapanieblas* because there is so much water scarcity. S2: and the fog comes through with water, and all this water is lost. S1: we have a town with fog. It's typical that there is fog here.
9. I got a standard Fog Collector. The standard Fog Collector is a world standard measurement for measuring fog [. . .] this standard Fog Collector, after a year of study, we could determine [. . .] can produce more than 20 L in 24 h, a single day. So, we were shocked; we never expected so much water.

Fog Collectors, or *atrapanieblas*, are explored in the literature as a technology for capturing water from fog in arid regions. The interviews show that the overall perception of the project *Atrapanieblas Comuneros* was successful in finding alternative water sources and an example of virtuous environmental

concern. Despite being a simple infrastructure, *atrapanieblas* are crucial materially and symbolically for the community. Implementing these infrastructures affected multiple dimensions: first, it enhanced sustainable projects and the fight against desertification. Second, it moved the community to collaborate once again. Third, it positively impacted mental health, giving new hope for a possible future in Peña Blanca. Fourth, it started a process of self-governance and empowerment, especially for women.

Nevertheless, there have been oppositions and contrasts since implementing any infrastructure is never neutral and concerns the political sphere more than the technical one (Ballester, 2019). The *atrapanieblas* in Peña Blanca have been implemented on a hill called Cerro Grande, which is the only place in Peña Blanca with constant fog presence. Due to the presence of fog, the Cerro Grande also represents one of the few places where the vegetation is sufficient for animal pasture. For this reason, the project required putting up a fence to close the area with the infrastructure so that animals could not enter and disrupt the nets. The fence, however, for some *comuneros*, represented another obstacle in finding grass to feed their livestock. The following excerpts reveal how the project *Atrapanieblas Comuneros* has received contrasting opinions and modified territorial and social geographies. These *comuneros* are a minority but represent the perceptions of *atrapanieblas*' effectiveness for the opposing side, indicating that the *atrapanieblas* provide insufficient water and benefit external entities more than the local community. The excerpts come from the same interview with one of the *comuneros* of the Las Pajas area—the driest area in Peña Blanca—that expresses concern regarding the *Atrapanieblas Comuneros* project.

10. No . . . I mean, many people think, maybe you also think, that the *atrapanieblas* are a solution, that they have water to distribute to people . . . it is not enough; it does nothing.
11. I don't get anything . . . in the end, it's . . . well, the ones who have gained money are not the *comuneros* [. . .] because here the community has never received anything, never anything. That is to say, we have not gained money with the *atrapanieblas*. On the contrary, we lost it because we closed the hill [the Cerro Grande] to put trees on it so that people from outside could come and see. Well, people . . . you yourself can go up there and [say] "hey how nice"! [. . .] But we do not have access to the hill for the animals [. . .] and we are the ones who are affected, in the part down here [in Las Pajas], not in the part above because the community is always divided in half. This is because the ones here graze the animals in this sector, and the others graze in another sector.

Communities are never homogenous, and internal conflicts should always be explored. However, in Peña Blanca, most of the *comuneros* voted in favour of the project and perceived it as a successful implementation. Despite the controversy, the *atrapanieblas* project gave the community a way to partially address the socio-environmental issue of water scarcity, functioning as a socially binding tool and an ecological solution. Hence, they created new socio-environmental conflicts but also addressed problems of stress and anxiety for the future,

desertification and soil degradation, and water availability for vegetation and animals.

As we have seen, communities such as Peña Blanca are often marginalised by national water policies in Chile that favour private and international companies (Alexander, 2006; Budds, 2013). Therefore, the concerns expressed in interviews 10 and 11 reflect broader questions about who benefits from essential resources and how to address issues of fairness and equity in water governance. These concerns not only regard local practices but also refer to national and international water access and distribution mechanisms. In the context of Chile's water politics, the *atrapanieblas* offered an alternative and fertile example of autonomous community governance and empowerment.

The *atrapanieblas*' implementation transformed the hydrosocial territory of Peña Blanca through the re-significance of fog presence and water absence. They transformed the relations between people, spaces and materiality, functioning as generators of agency (Di Tullio, 2023) for local people and as connectors for creating new social ties. For instance, the national and international visibility of the project created spaces for local entrepreneurship (artisanal products, slow tourism, education programs, hiking and so forth), allowing new forms of economic and cultural flows that served as a counter-narrative for enhancing self-autonomy and self-governance.

## 6 Conclusion

In this paper, we investigated how hydrosocial relations are framed among the *comuneros* of Peña Blanca in Northern Chile. We started by analysing keywords of the PBWC related to water present in the corpus using corpus-assisted methodologies. Then, we moved to a close reading of excerpts where those keywords occur. We deployed a framework drawn on Entman's framing paradigm to understand broad frames by which water relations are talked about and their functions. Then, we moved to contextualise those findings against field observations carried out during Author stay within the community.

Our results show that people in Peña Blanca frame water relations mostly in terms of water availability, *atrapanieblas*, water governance and infrastructure and that these frames serve the purpose of representing causes and effects and contextualise their position against Chile's recent history. In particular, the effects of poor water management by the Chilean government in the last 5 decades and the impacts of heightened droughts have exacerbated health problems, disrupted their agricultural economy and had a broader impact on the socio-natural entanglements of their community. At the same time, the discursive framing of the *comuneros* can also be considered counter-hegemonic, for it put forth ideas of community empowerment and antagonistic practices to reclaim their attachment to the environment and cultural identity.

This becomes particularly evident in the qualitative part of our results. Indeed, the excerpts presented provide a deeper perspective of how water relations have changed over time and how hydrosocial territories have undergone fundamental changes due to poor political management and privatisation, as well as natural and

climate-induced phenomena such as drought. In particular, what emerges from the interviews is the socio-natural character of hydro-social territories and their dynamic re- and co-production across time and space. What is more, the interviewees focus on how natural and cultural landscapes are intertwined and co-dependent so that the impacts of the aforementioned poor management are defined as an all-encompassing issue that involves human and non-human actors and affects social practices, natural cycles and health. Although it might sound obvious, it is crucial to mention in contexts where neoliberal rationalities and Western modernity have worked to depoliticise and flatten the debate, reducing complex and dynamic hydrosocial relations to a matter of technical management and market solutions.

Another crucial point emerging from the close reading of the interviews concerns bottom-up practices that, on the one hand, serve to fix water scarcity and, on the other, challenge poor top-down management. The focus on *atrapanieblas* can be seen as a means to reclaim identity, social cohesion and autonomy, as well as a way to assert the importance of traditional and local knowledge in water management in the face of the Chilean government. Nonetheless, *atrapanieblas* are also discussed as further means of marginalisation and vulnerabilisation for some community inhabitants, given that the structure needed for their functioning, although simple, represents a hindrance to other communal practices. Once more, we are reminded that beyond macro-level disparities between the governor and the governed, intra-community disparities call into question the idea of one-size-fits-all solutions across multiscale levels of governance.

Against this background, it is clear that complex and dynamic social, political, economic and natural entanglements cannot be reduced to the depoliticised narratives and practices of Western modernity and, in fact, need a multifaceted and transdisciplinary outlook. In line with this take, we tried to integrate Critical Corpus-assisted discourse analysis and Anthropological research and ethnographic fieldwork to provide an in-depth and far-reaching account of how hydrosocial dynamics are framed among Peña Blanca *comuneros* and their implication for water governance and cultural practices.

## Data availability statement

The datasets presented in this article are not readily available because there is no agreement with the interviewees to share interviews with external people. Requests to access the datasets should be directed to [viola.ditullio@iusspavia.it](mailto:viola.ditullio@iusspavia.it).

## Ethics statement

Written informed consent was not obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article because the informants were aware of being recorded and the information are not sensitive. Moreover, the data in the paper are anonymous.

## Author contributions

VD: Conceptualization, Investigation, Methodology, Writing–original draft, Writing–review and editing. LZ: Conceptualization, Data curation, Formal Analysis, Methodology, Writing–original draft, Writing–review and editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

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## Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fenvs.2024.1502191/full#supplementary-material>

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