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Water Extractivism and Decolonial Struggles in Mapuche Territory, Chile

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ABSTRACT: Forestry plantations on Mapuche lands in southern Chile are a critical socio-environmental issue. Through the lens of political ecology and using methods based on historical review, spatial data representation and ethnographic interviews, we propose the concept of water extractivism. We argue that its development via forestry expansion contributes to the lack of drinking water in Mapuche territory, a South American area with significant claims for land, water, native forests, human rights and political autonomy. Our findings reveal the coloniality of nature as it has been manifested in the development of water extractivism in southern Chile. This process began in 1881 with the dispossession of Mapuche communities from their lands by the state, and it continued during the 20th century with colonisation and the introduction of forestry plantations. The last two decades of socio-environmental problems have stemmed from forestry plantations related to a lack of drinking water. Decolonialisation struggles deployed by members of the Mapuche communities through direct action politics and in institutional arenas are among the main social responses to the negative consequences of water extractivism. We conclude by valuing the concept of water extractivism as an analytical tool within decolonial political ecology and we discuss the meaning of the current Mapuche decolonial struggles for water and cultural sustainability.

KEYWORDS: Forestry monoculture, Agua Potable Rural (APR), water trucks, decolonial political ecology, Wallmapu, Chile

INTRODUCTION

Recent debates in Latin American political ecology focus on the socio-environmental impacts of different types of extractivisms on local ecologies, institutions, native people and nations. From 2000 onwards, a new wave of extractivist activities began to take off in response to the growing price of commodities in markets of the Global North. In the years since, there has been a steady growth in demand from China, Japan, North America and Europe for commodities such as copper, cellulose pulp, wood, meat, soya, palm oil, avocadoes, and lithium. Motivated in part by the 'Beijing Consensus', which "uses China as an

alternative model for development in the Third World" (Turin, 2010), Latin American countries embarked on the re- primarisation of their economies, which is to say focusing on large-scale extraction and export of primary goods (Svampa, 2019). The global demand for natural resources implies intensified exploitation of Latin American nature, water ecosystems, environments, and socio-environmental processes at all scales; this, in turn, has created new waves of local resistance and contestations by communities that are directly and/or indirectly affected (Gudynas, 2015). Although many studies have investigated the relationships between water, extractivism and the (decolonial) resistance of communities in Latin America (for example, Ulloa and Romero-Toledo, 2018; Castro et al., 2019), none have analysed water extraction as a specific type of extractivism.

To fill this gap, we propose the concept of water extractivism as a conceptual tool to understand the structural processes of "birthing" extractivism (Ehrnström-Fuentes and Kröger, 2018), its development and impact, and the decolonial struggles associated with extractive activities on water ecosystems in the Global South. Along with the political ecologists Enrique Leff (2014, 2019) and Eduardo Gudynas (2015), we understand water extractivism to be a type of nature appropriation with historical, spatial, political and socio-environmental roots. It can be understood as the processes by which water is extracted from its original territories of life in large scale and/or high intensity, and then exported mainly to the Global North in the form of various commodities, without (or with minimal) processing.

Following this concept, we ask: What are the main socio-environmental processes triggered by water extractivism in Mapuche territory? How do the Mapuche decolonise their territories of life from water extractivism? Water extractivism evolved gradually during the 20th century via forestry plantations that were promoted by the Chilean state; these were privatised, beginning in 1974, under the Pinochet dictatorship (Clapp, 1995; Klubock, 2014; Torres et al., 2016). In 2006, importantly, the first regional march for the defence of water and territories took place, in the course of which hundreds of Mapuche marched 92 kilometres from the commune of Lumaco to Temuco, in the heart of their ancestral lands of Wallmapu. Their objective was to contest forestry plantations; they argued that, because pines and particularly eucalyptus consume a lot of water, the plantations were drying up their territories of life and dispossessing them of a vital resource (Seguel, 2006; Cuenca, 2018; Mapuexpress, 2018). Since this first march in 2006, the situation has worsened, and has become increasingly acute over the past decade of megadrought (Garreaud et al., 2019). In light of the increasingly severe lack of water and the territory's aridity, the government has called the situation a 'water emergency', while the Mapuche and members of water social movements have called it 'water looting' (*no es sequía, es saqueo,* that is, *it's not drought, it's looting*). Water trucks that are publicly funded and managed through municipalities have had to supply Mapuche and rural Chileans with drinking water (Ministerio del Interior, 2015; Fundación Amulén, 2019; Gobierno de Chile, 2020).

These controversial relationships between supporters of forestry plantations and those impacted by the effects of water extraction have already been documented in various places, including Chile (Huber et al., 2010; Stehr et al., 2010; Aguayo et al., 2016; Alvarez-Garreton et al., 2019; Martínez-Retureta et al., 2020), South Africa (Albaugh et al., 2013), Brazil (Koopmans, 2006; Kröger, 2012; Ferraz et al., 2019), and Uruguay (Perez, 2007; Silveira et al., 2016). These studies show the linkages and feedback between forestry monocultures and reduced water availability, and how both forestry plantations and cellulose mills contribute – albeit in different ways – to water imbalance in river basins or in other spatial units of the Global South (Jackson et al., 2005; Movimiento Mundial por los Bosques Tropicales, 2016; Kröger, 2014; Overbeek et al., 2012). The concept of water extractivism is useful for understanding these controversial relationships. In this respect, there is a need for a new political – ecological analysis to help disentangle hydrosocial processes; this is especially called for in indigenous territories such as those in Latin America, which have long histories of dispossession, genocide and cultural assimilation (Bengoa, 2016; Pineda, 2018). Historically, Mapuche communities have been resistant to colonial and neo-colonial projects such as the Spanish empire (from the 1500s to 1818), the state (from 1881 onwards) and, finally, large-scale forestry monocultures (since 1974). We show that water extractivism in Chile is occurring

through the export of large amounts of water in the form of pine, eucalyptus and related primary goods such as cellulose and lumber. Rural residents, poor peasants, and both Mapuche and mestizo communities are the main groups affected by, and contesting, water extractivism. The Mapuche have claims over lands, many of which have been appropriated by forestry companies (see, for example, Bengoa, 1985, 1999, 2014; Montalba and Carrasco, 2005; Seguel, 2006; Klubock, 2014; Pinto and Goicovic, 2015; Torres et al., 2016; Pineda, 2018; Mapuexpress, 2018).

We first present our theoretical framework, which is based on Latin American political ecology; we use this framework to discuss and define the concept of water extractivism and its relationship with decolonial socio-environmental struggles in indigenous territories. Second, we characterise the study area and present methods based on an historical review, thematic maps, and ethnographic interviews. Third, we present our results, which we first contextualise with a brief history of the Mapuche territory in southern Chile, focusing on forestry plantations as the main driver of water extractivism. We then present our findings, showing the growing socio-environmental problems generated by hydro-extractivism, the increasingly severe lack of water for human consumption, and the conflicts, resistance and decolonisation struggles undertaken by the Mapuche people. We conclude by valuing the concept of water extractivism as an analytical tool within decolonial political ecology and, finally, we discuss the current Mapuche decolonial struggles in terms of their implications for water and cultural sustainability.

THEORETICAL FRAMEWORK

The coloniality of nature and water extractivism in Latin America

In Latin America and Chile, extractivism has its roots in the Spanish conquest and colonisation that started in the 16th century; however, it persists to this day in other forms (Alimonda, 2011; Gudynas, 2015; Parra-Romero, 2016; Svampa, 2019; Jerez et al., 2021). The coloniality of power – a concept coined by Aníbal Quijano (2014) – expresses how, since the conquest, there has been "legitimization of power and the possession of wealth by a part of the population, according to a social classification of race and to the extent that a cultural whitening is carried out (imitation of European standards)" (Parra-Romero, 2016). For Quijano, this is the necessary and systematically hidden reverse of modernity (Quijano, 2014). The coloniality of power establishes a legitimising discourse which the modernity/coloniality approach (cf. Castro-Gómez and Grosfoguel, 2007) calls the coloniality of knowledge (cf. Lander, 2000). The reference is to a way of knowing based on the scientific and rational concepts of modernity. This implies a colonisation of indigenous people's local knowledge, which came to be subordinated to the dominant 'Western knowledge' (cf. Leff, 2019; Kothari et al., 2019).

In this vein, Alimonda (2011) coined the concept of coloniality of nature, which reiterates the argument of "the persistent coloniality that affects Latin American nature"; it "appears before hegemonic global thought and before the dominant elites of the region as a subaltern that can be exploited, razed, reconfigured, according to the needs of the accumulation regimes" (Alimonda, 2011: 22). Alberto Acosta concurred, stating that the coloniality of nature and extractivism is "a modality of accumulation that began to be forged in masse 500 years ago and was determined since then by the demands of the metropolitan centres of nascent capitalism" (Acosta, 2012, cited in Svampa, 2019: 15). Eduardo Gudynas defines extractivism as, "a type of extraction of natural resources, in large volumes or high intensity, that are essentially oriented to be exported as raw materials without or with minimal processing" (Gudynas, 2015: 13; Acosta and Brand, 2017: 31). He also placed the concept in historical terms, citing its colonial origin as being triggered by the Iberian conquest of Latin America (cf. Svampa, 2019); for example, the growing of many monocultures for export dates back to colonial times (cf. Alimonda, 2011) and export of these commodities continues to expand even now.

In this respect, Gudynas (2015) proposes a typology of "four generations of extractivisms", a classification based on temporal and spatial scales. The first generation of extractivisms refers to those

practiced during colonial times, until the beginning of the Latin American Republics in about 1810 to the 1820s. The main feature of this first generation of extractivism was that natural resources were obtained with human and animal force and with limited use of technology, especially in mining and in growing of monocultures (Gudynas, 2015: 22).

The second generation of extractivisms unfolded during the period of 1850 to 1900. During that half-century, the use of technology increased and took over from human and animal force; this, in turn, increased the volume and intensity of natural resource extraction. That development is key to the concept of water extractivism because the period is characterised by an increase in, "the consumption of energy, water, and other products in relation to the volume of resources extracted" (Gudynas, 2015: 23). Examples of this are forestry monocultures in Chile (Camus, 2006; Klubock, 2014) and mining in Latin America (Alimonda, 2011).

The third generation of extractivism began in the 1970s and still predominates. According to Gudynas, it currently is the main source of socio-environmental violence and conflict in Latin America; here, "the appropriation of natural resources is still increasing more in volume and intensity [and therefore] much more energy, water, and resources are [being] consumed for each unit of resource obtained" (Gudynas, 2015: 24-26). As will be discussed below, the year 1974 saw the large-scale expansion of forestry monocultures in Chile due to state policies; water extractivism was deepened through the planting of millions of pine and eucalyptus trees on the campesinos and Mapuche lands of southern Chile.

In the fourth and final generation of extractivism, the appropriation of natural resources continues to grow in volume and intensity but new extractive technologies are used such as fracking; therefore, the extraction and export of water and other natural resources continues to grow (Gudynas, 2015: 26).

Considering that human and non-human activities need water to live, and following Gudynas' classification, we argue that from colonial times until globalisation all extractivisms have been increasing their water use. We therefore define water extractivism as a mode of appropriation of nature with historical, spatial, political and socio-environmental roots; it includes processes by which water is extracted from the territories of life at a large scale or at high intensity and is then exported mainly to the Global North in the form of different types of commodities, without – or with minimal – processing. The forms in which water is exported include minerals, food, forestry monocultures, wood, cellulose pulp, palm oil, meat, avocadoes, copper, and lithium. The water extractivism concept could be applied to any of these or to other specific commodities, because they all imply large-scale, intensive extraction and export of water. This water is extracted from a variety of locations and sources including local water bodies such as wetlands, surface water (rivers and lagoons), glaciers, and aquifers. This paper focuses on forestry monocultures, which consume and pollute both surface and groundwater.

Decolonisation struggles and indigenous resistance to water extractivism

Appropriation of nature through water extractivism elicits resistance and social contestation. Recognising that all "ecological processes are real and external to human experience, but that all knowledge claims about processes are socially constructed" (Forsyth, 1998: 112), in this paper we afford both the biophysical (such as hydrological flows) and socially constructed sides of water extractivism. With regard to social construction, decolonial political ecology addresses current water extractivism as a complex mode of social domination and violence (see Alimonda, 2011; Parra-Romero, 2016; Leff, 2019; Jerez et al., 2021). This is grounded in the fact that in Latin America, many environmentalists have suffered persecution and assassinations by extractivist companies and state agents (Gudynas, 2015; Martínez-Alier and Navas, 2017). Faced with the violence that accompanies water extractivism, communities and activists are not passive; they deploy actions in defence of their territories of life, in order to conserve and reproduce their ontologies and ways of 'being' and 'existing' in the world (Escobar, 2016; Leff, 2014, 2019). As Leff (2014: 235) points out,

> the ecological destruction generated by the exploitation and appropriation of nature during the colonial regime and the current world economic order has been accompanied by social exclusion, the submission of traditional practices, and the imposition of western knowledge in the conquest and domination of the territories of the third world. Consequently, indigenous peoples affirm that their emancipation struggles are political and epistemic: the decolonisation of knowledge becomes a condition for their political – cultural emancipation and for the reconstruction of their territories of life.

The decolonisation process is configured with social constructions such as the re- territorialisation and politicisation of the hydro cosmologies (Boelens, 2015), ontologies and ecological epistemes of native peoples (Escobar, 2016). Astrid Ulloa (2015: 327) calls this Indigenous-Alter-Geopolitics, which,

> involves indigenous people's territorial control and planning, and the continuity of ancestral relationships with the nonhuman through the transmission of knowledges, in order to renew species diversity and nature management, consistent with their own environmental practices, and revitalize strategies for the defense of territory, autonomy and political and environmental self-determination.

Leff (2014: 248) reflects on this process as a politics of difference that goes in "search for sustainability [and that] merges with the construction of cultural rights and the demands of civil society for decolonisation, autonomy, the diversity and dignity of peoples".

The decolonial agenda and indigenous awakening in Latin America emerged in parallel with the intensification of water extractivism at the end of the 1990s (cf. Lander, 2000; Bengoa, 2016). Political action consists of attempts to stop the advance of extractivism which is dispossessing them (once again) of their ancestral territories and sacred sites. The agenda also consists of rebuilding ancestral knowledge and memories based on an ecological episteme oriented to the sustainability of life (Leff, 2014, 2019). The Mapuche, on which this paper focuses, experienced a turning point in 1997 with regard to their decolonisation process to recover ancestral knowledge, culture, lands, and waters. At that point, the first forestry trucks were burned by radical Mapuche activists in what is referred to as 'the Lumaco events' (cf. Tricot, 2013; Pairicán, 2014). This Mapuche direct action politics (cf. Heynen and Van Sant, 2015) gave life to a new revolutionary political organisation: the *Coordinadora Arauco Malleco* (CAM). Today, after more than two decades, this organisation has grown into a network of people, communities, and movements that has formed the so-called Autonomous Mapuche Movement, declaring itself to be anti-extractivist and decolonial. Its main opponents are forestry corporations and *colonos* (settlers), who in their eyes are the main drivers of the water extractivism that is operating in their ancestral territories (Tricot, 2013; Llaitul and Arrate, 2013; Klubock, 2014; Pinto and Goicovic, 2015; Torres et al., 2016; González-Hidalgo and Zografos, 2017; Pineda, 2018; CAM, 2019).

CHARACTERISATION OF THE STUDY AREA

We focus on the Chol-Chol and Lumaco River basins, located in the Araucanía region of southern Chile. This is an area of 573,557 hectares (Figure 1 and Table 2) with a population of 144,822 (Table 1). The population is 21.2% Mapuche, who are mainly distributed in the rural areas of both basins. This territory includes important morphological diversity from which originates a wide variety of climates, soils and ecosystems; these have been the natural substrate of native forests, which state-directed development then oriented towards massive and intensive forestry production. Along with this physical and ecological diversity, significant cultural diversity is manifested in the form of Mapuche communities, non-indigenous peasants, farmers, urban inhabitants, and large- and medium-sized timber entrepreneurs.

Households and people are located near the main communication and transportation hubs, and near rivers and estuaries. Surrounding them are significant and continuous plots of land that are covered with forestry plantations, particularly in the southwest area of the river basins (Figure 2).

Table 1. Types of communities at the Chol-Chol and Lumaco River basins.

Population	Area		Total	Percentage of total
	Urban	Rural		
Mapuche	16,367	14,293	30,660	21.2
Non-Mapuche	75,625	38,537	114,162	78.8
Total	91,992	52,830	144,822	100

Source: Based on INE (2017).

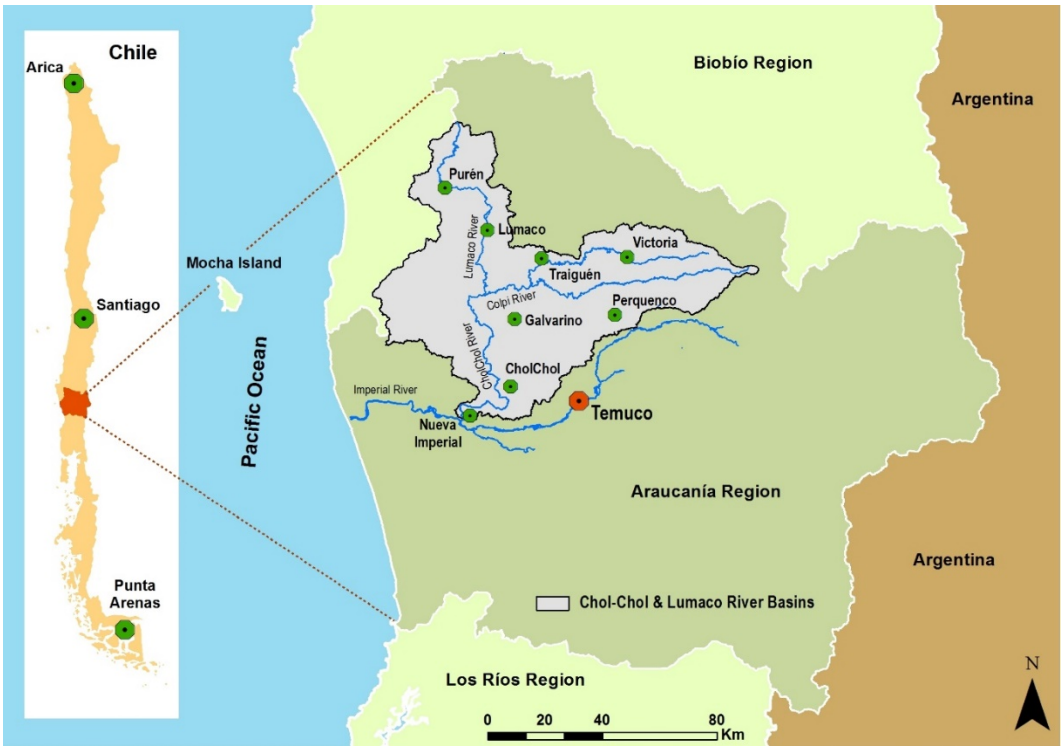
Table 2. Mapuche lands and forestry plantations in the Chol-Chol and Lumaco River basins, Araucanía region, Chile.

Typology	Area (hectares)	Percentage of basin
Forestry plantations [(1)]	185,476	32.3
Mapuche lands [(2)]	156,077	27.2
Claimed land [(3)]	47,402	8.3
Other lands	184,602	32.2
Total	573,557	100

Source**:** [(1)] Based on CONAF (2013); it includes both mature and fresh young pine and eucalyptus plantations. [(2)] Based on CONADI (2015); it includes both lands originating in *Títulos de Merced* (Concession of Land Titles) and lands purchased through CONADI subsidies (Art. 20-a and Art. 20-b Law 19.253). [(3)] Based on Centro EULA-Chile (2010); this is an estimation of lands claimed by Mapuche communities from the Chol-Chol and Lumaco River basins; most lands are claimed on the basis of ancestral occupation or lands lost due to Concession of Land Titles.

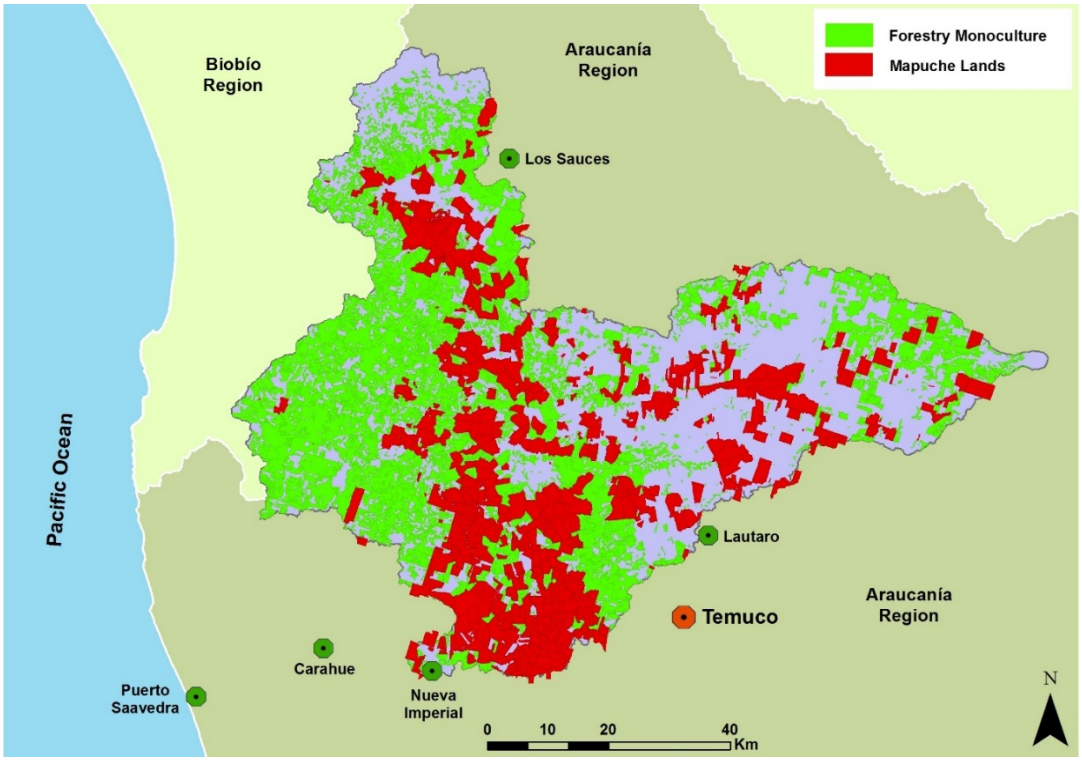
Despite the historical interventions deployed by Chile over the Mapuche lands – especially during the periods of settlement in reservations (1881-1927, see below) – the division of *Títulos del Merced* (Concession of Land Titles) and the assignment of individual property as *hijuelas* (inherited land) from the 1980s, a significant number of indigenous communities and lands in both basins still exist that are recognised by the Chilean state. These communities comprise more than 150,000 hectares (ha) in both basins (27.2%; see Table 2 and Figure 2). Another relevant issue is that large portions of both basins are part of the Indigenous Development Areas (IDAs) Puel Nahuelbuta and Ercilla (Figure 3). IDAs are territorial management public instruments, which are designated areas of the country with high concentrations of indigenous people where the state promote programs on matters of land, water and irrigation.

Figure 1. Location of the study area: the Chol-Chol and Lumaco River basins, Chile.



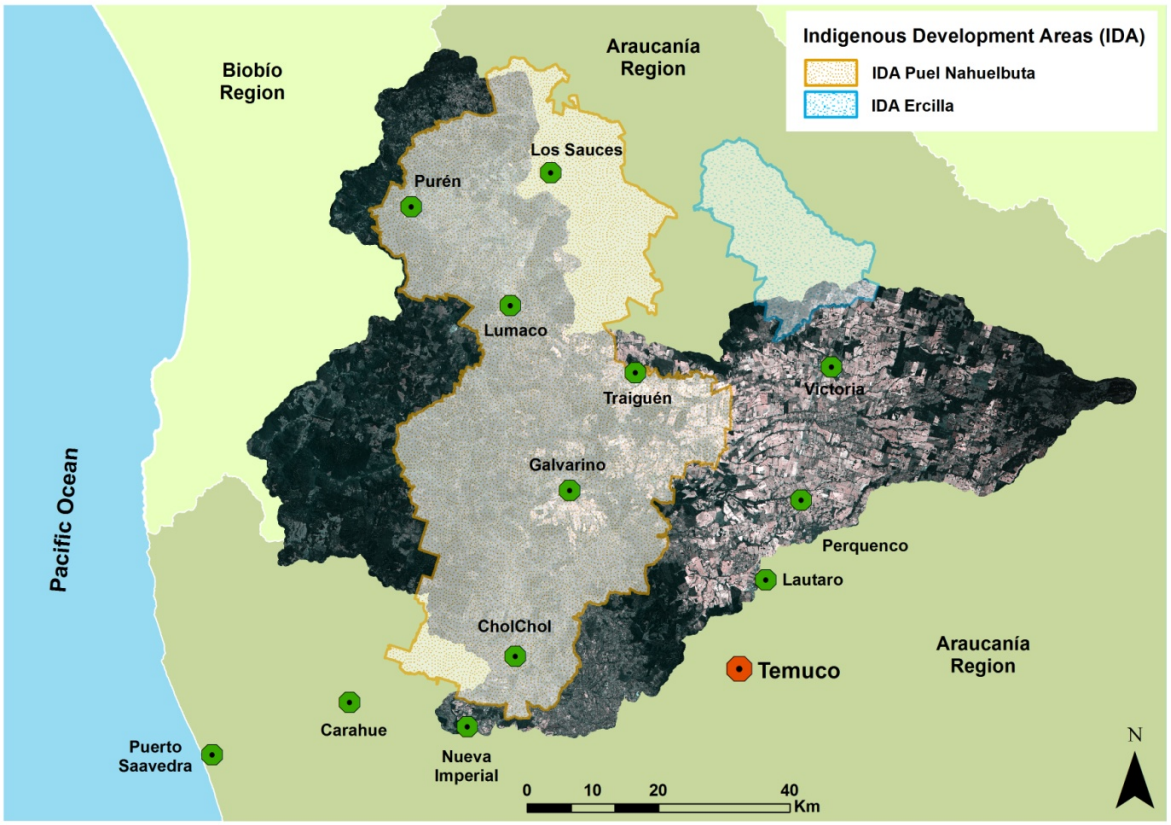
Source: Authors' own elaboration, based on Araucanía regional government data and Centro EULA-Chile (2010).

Figure 2. Forestry monoculture and Mapuche lands in the Chol-Chol and Lumaco River basins, Chile.



Source. Authors' own elaboration based on CONADI (2015), Araucanía regional government data, and Centro EULA-Chile (2010).

Figure 3. Chol-Chol and Lumaco River basins, Indigenous Development Areas Puel Nahuelbuta and Ercilla.



Source: Authors' own elaboration based on the Araucanía regional government, CONADI (2015), and Centro EULA-Chile (2010).

METHODS

Primary and secondary sources of information were collected and analysed. First, a literature review was conducted on the social construction of the historical development of forestry plantations as the main driver of water extractivism. Second, in order to characterise biophysical changes in both water availability and supply, databases and systematic and nonsystematic records were collected from the study area's 11 municipalities over a period of three years (2016-2018). These included hydrological records (DGA, 2021); records of people to whom drinking water is distributed by water trucks over different periods; background information on rural drinking water projects (*Agua Potable Rural*, or APR); and water supplies provided by both the Araucanía regional government and *Aguas Araucanía*, the main private supplier of drinking water in that region's urban areas. The characterisation of water supply mainly considered the estimated per capita consumption of water by families and rural populations supplied by water trucks, with data from January 2017. These figures were compared to the international standards for drinking water consumption published by the World Health Organisation (WHO). Additional information was obtained from digital coverage provided by the Araucanía regional government, namely, zones declared to be suffering a water emergency,[1] spatial distribution of forestry plantations, and the

[1] Zones registered as having suffered from a 'water emergency' are those geographic units (communes, provinces) that benefitted from public financing aimed at giving relief from water scarcity and other related climatic factors. Public policies address the lack of water for irrigation (Agricultural Emergency Decree, enacted by the Ministry of Agriculture:

location of Mapuche lands. Spatial information about the land claims of Mapuche communities was obtained from the National Corporation for Indigenous Development (CONADI).

Among the primary resources, ethnographic interviews were conducted with municipal professionals who were in charge of the management of water trucks; ethnographic interviews with leaders, traditional authorities (such as *Lonkos*, or chiefs), and presidents of Mapuche communities were also carried out. Finally, for the same observation unit (Chol-Chol and Lumaco River basins), various maps showing environmental and cultural assets such as forestry plantations, Mapuche ancestral lands, and rural drinking water projects were created by using ArcMap software. Overall, this biophysical and ethnographic evidence sought to illustrate how water extractivism and its socio-environmental consequences are being contested by the decolonialisation process that is being conducted by the Mapuche people in Wallmapu, the cultural territory that includes parts of Chile and Argentina from the Pacific to the Atlantic (Pineda, 2018; Bañales-Seguel et al, 2020).

FINDINGS

On the coloniality of nature and water extractivism in Chilean and Mapuche territories: A brief history

By 1881, the Chilean state and army decided to cross the Biobio River, which had been established in colonial times as the frontier between the Spanish Crown and the Mapuche people. Since the birth of the Chilean Republic in 1818, this frontier had been respected by the nascent Chilean army and society; however, six decades later and in the middle of the Pacific War (1879-1884), the Chilean state invaded Wallmapu and dispossessed the Mapuche from about 10 million ha of their territory south of the Biobio River. It then distributed much of this land in the form of concessions to new colonos arriving mainly from Germany, Italy and Switzerland (Bengoa, 1985; Klubock, 2014; Pinto and Goicovic, 2015; Torres et al., 2016).

To introduce agriculture in the new 'Chilean' lands, colonos cleared native forests; these were burned to make space for the expansion of agricultural activities (Camus, 2006: 169). Several years later, soil erosion problems appeared in the cleared lands. In 1889, to address this problem, the Chilean government hired a German forester named Federico Albert "to head a new Water and Forestry Department". By 1910, Albert had "[become] the first director of the Ministry of Land and Colonization's Department of Water and Forests" (Klubock, 2014: 81). He introduced the scientific management of forests in order to cope with the new "ecological disorder" (ibid: 58-89) that had been produced by the destruction of native forests over almost 50 years (1881-1927), during which the Chilean state had worked to both control Mapuche ancestral lands and allocate them through *Títulos de Merced* (Concession of Land Titles).

During these decades, Albert and his followers worked for the state, promoting forestation with Monterey pines imported from Oregon, USA. This was considered to be the solution to the problem of soil erosion and to the "droughts wrought by unchecked deforestation" (ibid: 81), which accorded with the social constructions and common knowledge of those times (cf. Forsyth, 1998). State-directed forestry policy began to be implemented in 1931 and gradually developed during the 1940s and 1950s (Camus, 2006: 167-247). Examining these historical and socio-environmental processes shows that the coloniality of nature was the origin of water extractivism in Chile. The latter emerged along with state policies promoting colonisation of the Mapuche territory and deforestation, to introduce agriculture. Forestry monocultures were introduced to cope with soil erosion and emerging droughts, which had been

http://dgir.minagri.gob.cl/emergencias-agricolas/); however, they also allow for the limiting of irrigation and other types of extraction in order to conserve drinking water (Water Scarcity Decree, enacted by the National Water National DGA: https://dga.mop.gob.cl/administracionrecursoshidricos/decretosZonasEscasez/Paginas/default.aspx).

caused precisely by destruction of native forests and by the disintegration of Mapuche society that occurred after the genocide (Bengoa, 1985, 2016).

During the first half of the 20th century, as a result of state policies, private state-subsidised forestry plantations grew and began to be profitable. Thus, by 1960, there were already approximately 200,000 ha of mature pine plantations in southern Chile (Klubock, 2014: 185). The agrarian reform undertaken by the government of Eduardo Frei Montalva (1967-1970) represented continued expansion of water extractivism through state-directed forestry development, but also included ruptures (ibid: 177). Frei kept up and expanded the state forestry project, but the first rupture was that he expanded the social groups who benefitted from state forestry development. This strategy "made [it] possible for small-holders to plant pine on their eroded land and mix stands of pine with pasture, garden crops, and commercial crops such as wheat" (ibid: 206); this included planting forestry monocultures on both peasant and Mapuche lands. The second key rupture was the promotion of a new stage for the forestry project through the construction of two cellulose plants in southern Chile, in the communes of Arauco and Constitución.

The Allende government (1970-1973) continued the policies of agrarian reform. It also continued reforestation with pine and eucalyptus as a means of coping with soil erosion. Because of the continued destruction of native forests, this problem had never been resolved. He simultaneously undertook to meet Mapuche and peasants' demands for land and water. In practical terms, Allende's policies transferred around 60,000 ha to the Mapuche, adding up to a total of approximately 170,000 ha between 1964 and 1973 (Mariman, 2017: 264). They were all (again) dispossessed during the Pinochet dictatorship.

With Pinochet's coup d'état on 11 September 1973, a second stage of forestry development began in southern Chile and in the Mapuche territory. This phase reversed the 'social forestry' policies implemented together with agrarian reform under Frei and Allende, reorienting them toward privatisation, global markets, and corporate profits. In other words, the state-directed forestry project, which had been oriented primarily towards the internal market, was transformed into an extractivist forestry project oriented mainly to exporting to the Global North. According to Gudynas (2015), this corresponds to third generation extractivism whereby, from 1974 onwards under Decree Law 701, the forestry project was reconfigured as a regime of private accumulation secured by state subsidies.

Under new policies of privatisation implemented by Pinochet and the Chilean economists educated mainly at the University of Chicago's Department of Economics, who were referred to as the 'Chicago Boys', the cellulose plants constructed by Frei in Arauco and Constitución were privatised. In 1977, these industrial sites were transferred to the Cruzat-Larraín group. They were then re-transferred to the state in 1983, due to the global and national economic crisis. In 1984, they were reprivatised and given to the Angelini group, who continue to own them under the name *Forestal Arauco* (Clapp, 1995: 281 – 288; Fazio, 1997; Klubock, 2014: 242, 244, 270; Torres et al., 2015). The Angelini group took control (via privatisation) not only of the cellulose mills in Arauco and Constitución, but also of vast tracts of land containing forestry plantations. The Matte group, through the *Compañía Manufacturera de Papeles y Cartones* (CMPC), took control of Forestal Mininco in 1979 and INFORSA in 1984; the latter included the pulp plant in the commune of Nacimiento (Fazio, 1997: 174, 181-182).

The privatisation of these companies included the transfer of important industrial assets such as factories, cellulose plants, sawmills, and lands on which grew both native forests and plantations of pine and eucalyptus (Klubock, 2014: 243). Since then, the Angelini and Matte groups (Forestal Arauco and CMPC) have been the main players controlling, driving and profiting from forestry projects. They are therefore among the main drivers of water extractivism in southern Chile and the Mapuche territory. Pinochet, in effect, kept the previous Keynesian forestry project intact, but under a subsidiary state and corporate power represented mainly by Forestal Arauco and CMPC. This corporate power was enhanced after democracy was restored in 1990. Between 1997 and 2011, for instance, it is estimated that forestry

plantations in Chile increased by 753,000 ha, with an annual increase of 37,000 ha. It was estimated that by 2019, the total area covered by forestry plantations nationwide would be around 3,113,943 ha (INFOR, 2019: 26). Half of this expansion of forestry plantations is directly due to state subsidies based on DL 701, with most of the subsidies going to Forestal Arauco and CMPC (Carvajal, 2015). Through state policies that promote forestry plantations' expansion in scale and intensity, water extractivism continues to grow in the territories of life. Similar state policies have been implemented in other Latin American countries such as Brazil (Kröger, 2012) and Uruguay (Ehrnström-Fuentes and Kröger, 2018). In Chile, water extractivism has a suite of consequences; these include the continuation of long-standing conflicts of land dispossession (cf. Bengoa, 1985; Klubock, 2014) and the destruction of native forests (cf. Torres et al., 2015), as well as other new problems like greater exposure to megafires (cf. de la Barrera, 2018), and an increase in the number of communities dispossessed from direct drinking water access.

Hydrosocial consequences of water extractivism in the Chol-Chol and Lumaco River basins

The territories of the Chol-Chol and Lumaco River basins display severe hydrosocial consequences of prolonged water extractivism associated with forestry plantations and with climatic and other locational factors. There is an increasing water demand by forestry plantations; this is accompanied by reduced precipitation in the area. In this section, we present biophysical and hydrological evidence of these processes. We then move to the social constructions and agendas mobilised by both forestry corporations and local people regarding epistemic and decolonial struggles over water in Mapuche territory.

Climatic factors and Chile's megadrought

Coupled with water extractivism, since 2009 central and southern Chile have been affected by a rainfall deficit of between 25 and 30%; it has been described as "the driest decade since there is record" (Rojas et al., 2019: 17). Precipitation records for the Araucanía region show a decrease from an average of 1150 millimetres (mm) per year in the 1960s to about 800 mm per year during the 2010s. (DGAC, 2020; Biblioteca del Congreso Nacional, 2020). In the study area, the situation is similar. Hydrological records for the Lumaco and Chol-Chol River basins currently show annual precipitation not in excess of 1000 mm per year, compared to annual precipitation values of 1400 mm per year recorded between 1990 and 2005. This means that between 2005 and 2020, the average annual rainfall values observed in the Chol-Chol and Lumaco River basins have decreased by around 400 mm. Between 2011 and 2020, the average annual flow of the Traiguén River decreased from 3.7 to 2.5 cubic metres per second (m^3/s); during this same period, the average annual flow of the Lumaco River decreased from 13.2 to 9.8 m^3/s, and the average annual flow of the Chol-Chol River fell from 105.8 to 77.6 m^3/s (DGA, 2021). This is consistent with the decrease in rainfall in the study area (DGA, 2021). With regard to temperature, data from the DGAC (2020) indicates that between 1996 and 2020, average annual temperatures remained constant, averaging 11.3°Celcius (C) in both the Araucanía region and the study area. Records of maximum average temperatures for the same period, however, show an increase of 0.5°C, with more months of the year showing higher temperatures. This situation has been described as a prolonged megadrought (cf. Centro de Ciencias del Clima y Resiliencia, 2015; Garreaud et al., 2019).

Along with water extractivism, it has contributed to the fact that around 500,000 of the nation's people are living without a secure supply of domestic piped water and should be supplied with water trucks. Of this figure, approximately 100,000 are in Mapuche communities and in rural parts of the Araucanía region (Ministerio del Interior, 2015: 43; Fundación Amulén, 2019); of these, 19,733 live in our study area (Table 3). Overall, the water shortage has mainly affected rural communities, with the gradual drying up of wells and watersheds that have been their traditional sources of water for all purposes, including human consumption, irrigation and cultural ceremonies.

Locational factors and water trucks

According to the stories told by the municipal civil servants who manage water trucks and by members of the Mapuche community, this situation has had significant adverse effects on their communities and territories for more than a decade. During those increasingly dry years, the constant lack of water has forced the issuance of public policies at national and local scales to ensure the supply of water to Mapuche and Chilean campesino communities. The main strategy is the use of private water trucks to deliver water to people in state-declared water emergency zones; however, new rural drinking water projects (APRs) have also been implemented and some state-subsidised *norias* (dug wells with mechanised pumps) have been installed. Like in southern Chile, tanker-delivered water is also a common practice in the forestry-affected regions of Uruguay (cf. Ehrnström-Fuentes and Kröger, 2017).

The new water policies issued by the Chilean government have allowed them to meet the demand for direct human water consumption. The new APRs and artisanal supplies such as norias satisfy these demands relatively well; however, the supply of drinking water by private water trucks cannot fully meet the communities' water needs, and the per capita consumption of those supplied by tanker is lower than the WHO minimum of 70 litres/person/day.

Water trucks supply some rural communities of the Chol-Chol and Lumaco River basins with almost 80% of their water (Tables 3 and 4); for example, out of the 6996 rural inhabitants of the Chol-Chol commune, 5417 (77.4%) survive on drinking water provided by trucks (Table 3). Although in 2010, at the beginning of the megadrought, this was thought to be a temporary policy, it has become a permanent state policy because of the persistence of almost year-round water shortages. The replenishment of groundwater by the annual 1000 mm of rainfall might be expected to satisfy local water needs; in the study area at least, however, groundwater supplies are being increasingly desiccated by forestry plantations (Table 5).

In the urban area of Temuco, average per capita water consumption reaches 128 litres per day, with an average of 157 litres in summer and 112 litres in winter (Interview with personnel of Aguas Araucanía, 2017). Less than 20 kilometres away, however, in rural territories of the Temuco commune in the Chol-Chol River basin, consumption decreases to 50 litres/person/day. This is an area almost entirely supplied by water trucks (Table 4). The critical issue is thus that the water shortage exists only in rural areas, particularly in communes with a greater presence of Mapuche communities such as Chol-Chol, Temuco, Galvarino, and Lumaco. These socio-spatial and ethnic consequences of water extractivism are particularly evident in territories of the occidental watershed of the Chol-Chol and Lumaco River basins, which have a steep topography and a predominance of forestry plantations (Figures 2 and 4A). This confirms that, together with a decrease in rainfall, a main factor associated with water extractivism is forestry monoculture (Tables 4 and 5).

Overall, 37% of the communes' rural population is supplied by water trucks, especially in Temuco, Lautaro, Chol-Chol, Nueva Imperial, and Galvarino. In almost all cases – and regardless of the number of inhabitants who benefit from water distribution – the estimated per capita consumption is under the minimum WHO standard of 70 litres of water per person per day. The most critical situations are observed in the communes of Nueva Imperial (24.5 litres/person/day), Perquenco (26.8 litres/person/day), Lumaco (27.5 litres/person/day), and Los Sauces (28.6 litres/person/day). Only Chol-Chol presents an average per capita consumption higher than the WHO reference value (84 litres/person/day).

Table 3. Communities supplied by water trucks in rural areas under a water emergency, Chol-Chol and Lumaco River basins, Chile.

Commune	Surface within watersheds (%)	Total population	Urban population	Rural population	Rural population supplied by water trucks	% of rural population supplied by trucks
Chol-Chol	93	11,323	4327	6996	5417	77.4
Galvarino	100	11,996	4149	7847	3222	41.1
Traiguén	62	17,721	14,257	3464	1001	28.9
Lumaco	100	9548	4033	5515	1761	31.9
Purén	100	11,779	7533	4246	1090	25.7
Temuco	57	25,498	16,558	8940	3354	37.5
Lautaro	17	2839	1188	1651	1308	79.2
Nueva Imperial	16	11,203	9451	1752	390	22.3
Victoria	91	32,979	24,773	8206	1435	17.5
Perquenco	92	6570	3561	3009	323	10.7
Los Sauces	35	3266	2162	1204	432	35.9
Total	…	144,822	91,992	52,830	19,733	37.4

Source: INE (2017) and data collected in municipalities of the study area.

Table 4. Per capita water consumption estimated for rural people of the Chol-Chol and Lumaco River basins

	Rural population (thousands) (1)	Rural families supplied (1)	Number of water trucks	Water provided per family (2) (l/week)	Estimated per capita consumption (l/person/day)	Relation with standard (%) (3)
Chol-Chol	6996	1450	19	2000	84	20
Galvarino	7847	1200	11	1250	44.6	-36.3
Traiguén	3464	600	4	750	33.5	-52.1
Lumaco	5515	518	6	1000	27.5	-60.7
Purén	4246	380	3	1000	31.7	-54.7
Temuco	8940	2000	26	1225	50	-28.6
Lautaro	1651	1857	8	1800	42.9	-38.7
Nueva Imperial	1752	1300	11	600	24.5	-65
Victoria	8206	684	5	1000	40.8	-41.7
Perquenco	3009	147	1	750	26.8	-61.7
Los Sauces	1204	326	4	1000	28.6	-59.1
Total	52,830	10,462	98	…	39.5	-43.6

Note: (1) Information provided by INE (2017) and by people from the municipalities in charge of drinking water distribution to rural areas; interviews carried out in January 2017. (2) Data obtained in interviews with municipal civil servants in January and March 2017; figures correspond to water distribution values in January 2017. (3) Standard of 70 litres/person/day is from the World Health Organisation (WHO).

Water transportation has required substantial public expenditure for the purchase of water trucks and of drinking water from sanitary companies, as well as for the prospection and planning of new rural drinking water projects and artisanal supplies. According to the information provided by the person in charge of drinking water distribution in Chol-Chol, the municipality invests about CLP$40 million a year (US$66,000) to pay for drinking water, which is bought from Aguas Araucanía. Meanwhile, the regional government invests approximately CLP$684 million per year (US$1.1 million) in the rental of water trucks for water transport and distribution. In 2017, 19 water trucks serviced the rural communities in Chol-Chol for the year, with an annual cost of CLP$36 million per truck (US$45,000), which included maintenance and drivers' salaries. Water extractivism is putting pressure on the public resources needed to cope with the water crisis. These figures and costs are similar in other communes of the study area, the only variation being number of beneficiaries, number of trucks, and periods when water is distributed. The situation may become even more critical due to the exhaustion of water sources at the catchment points (wells) of the rural drinking water (APR) projects.

Land use factors drying up rural drinking water projects and other artisanal water systems

According to the information provided by municipal civil servants, some APRs in the area have had severe problems supplying water, mainly due to the growing water extractivism by forestry plantations. The data shows that by 2003 there were 168,757 ha of forestry plantation in the study area; by 2013, this had increased to 185,476 ha. Between 2002 and 2017, the area's rural population decreased from 55,305 to 52,830 people (Table 5). Despite this reduction, however, due to reduced water availability, demand exceeded the declining capacity of the APRs and, as we observed, water trucks began to fill some APR tanks. According to the head of the Department of Rural Development of the municipality of Temuco, the lack of water has extended to some tubewells that are deeper than those that have around 20 metre-deep, the so-called norias of the rural people. In summary, our observations indicate that water shortages resulting from extractivism are quite widespread in the territory of the Chol-Chol and Lumaco River basins.

It is important to note that the drilling of wells and the establishing of new APRs has been quite widespread in the territory, yet results have been unsatisfactory. Although they initially provided water, many have dried up after two or three years, suggesting that groundwater recharge has been critically reduced by both decreasing precipitation and the expansion of the area covered by forestry plantations (Table 5). According to civil servants from the municipality of Galvarino, many norias or APR projects have failed because drilling did not yield sufficient, or sometimes any, water. A limited budget for prospecting, together with drilling failure, resulted in delayed APR projects and thus discontent in some Mapuche communities. Those projects are considered fundamental to solving their lack of direct access to drinking water and their resultant dependence on water trucks.

The evidence therefore shows that most of the territory of both basins is suffering from water shortages that are a consequence of water extractivism/climate change, particularly for human consumption, small-scale irrigation, and Mapuche cultural ceremonies. Figure 4 is integrative and shows the spatial distribution of forestry plantations (A), Mapuche lands (B), water emergency zones (C), and APR projects and other artisanal supplies (norias, dug wells) (D). We observe that forestry plantations are mainly located towards the west and in the middle area of the basin. In the eastern watershed of the Chilean Coastal Range and in the Central Valley are located both Mapuche lands registered under CONADI and ancestral land claimed by Mapuche communities (B) which, in turn, largely overlap with the zones decreed by the government to be water emergency areas (C). The latter correspond to areas with a higher concentration of Mapuche communities – mainly in the Chol-Chol, Nueva Imperial, Galvarino, Purén, and Lumaco municipalities – and the areas in which APR projects and artisanal supplies are located (D). The spatial data thus shows that forestry plantations (A) are associated with both a lack of water (C/D) and disputes over land with Mapuche communities (B). The forestry area to the west of the basin is not associated with water emergency areas because the population is extremely small and therefore water

supply is unproblematic. Although it is difficult to fully disentangle causalities, hydrological knowledge confirms that pine and eucalyptus trees desiccate the land, that is, reduce run-off and deplete groundwater (cf. Stehr et al., 2010; Silveira et al., 2016; Overbeek et al., 2012; Ferraz et al., 2019; Martínez-Retureta et al., 2020). The fast-growing tree varieties favoured by industries are, unsurprisingly, associated with high water consumption; this constitutes a growing water requirement that, in turn, collides with declining precipitation.

Table 5. Evolution of the rural population and forestry monocultures in the Chol-Chol and Lumaco River basins.

Municipalities	Rural population 2002[(1)]	Rural population 2017[(1)]	Annual rate of change	Forestry monoculture 2003 in hectares (ha)[(2)]	Forestry monoculture 2013 (ha)[(2)]	Annual rate of change
Chol-Chol	6425	6996	0.37	12,707	15,379	0.83
Galvarino	9057	7847	-0.62	19,472	24,132	0.93
Traiguén	4001	3464	-0.63	10,549	13,821	1.17
Lumaco	7273	5515	-1.20	61,047	66,480	0.37
Purén	5264	4246	-0.93	14,693	17,375	0.73
Temuco	6565	8940	1.34	6,887	7,189	0.19
Lautaro	1683	1651	-0.08	3,856	4,389	0.56
Nueva Imperial	1713	1752	0.10	1,169	607	-2.85
Victoria	8310	8206	-0.05	22,713	23,724	0.19
Perquenco	3138	3009	-0.18	2,270	2,790	0.90
Los Sauces	1876	1204	-1.93	13,391	9,586	-1.45
Total	55,305	52,830	-0.20	168,757	185,476	0.41

Source: (1) Information provided by INE (2003, 2017). (2) Information provided by CONAF (2003, 2013).

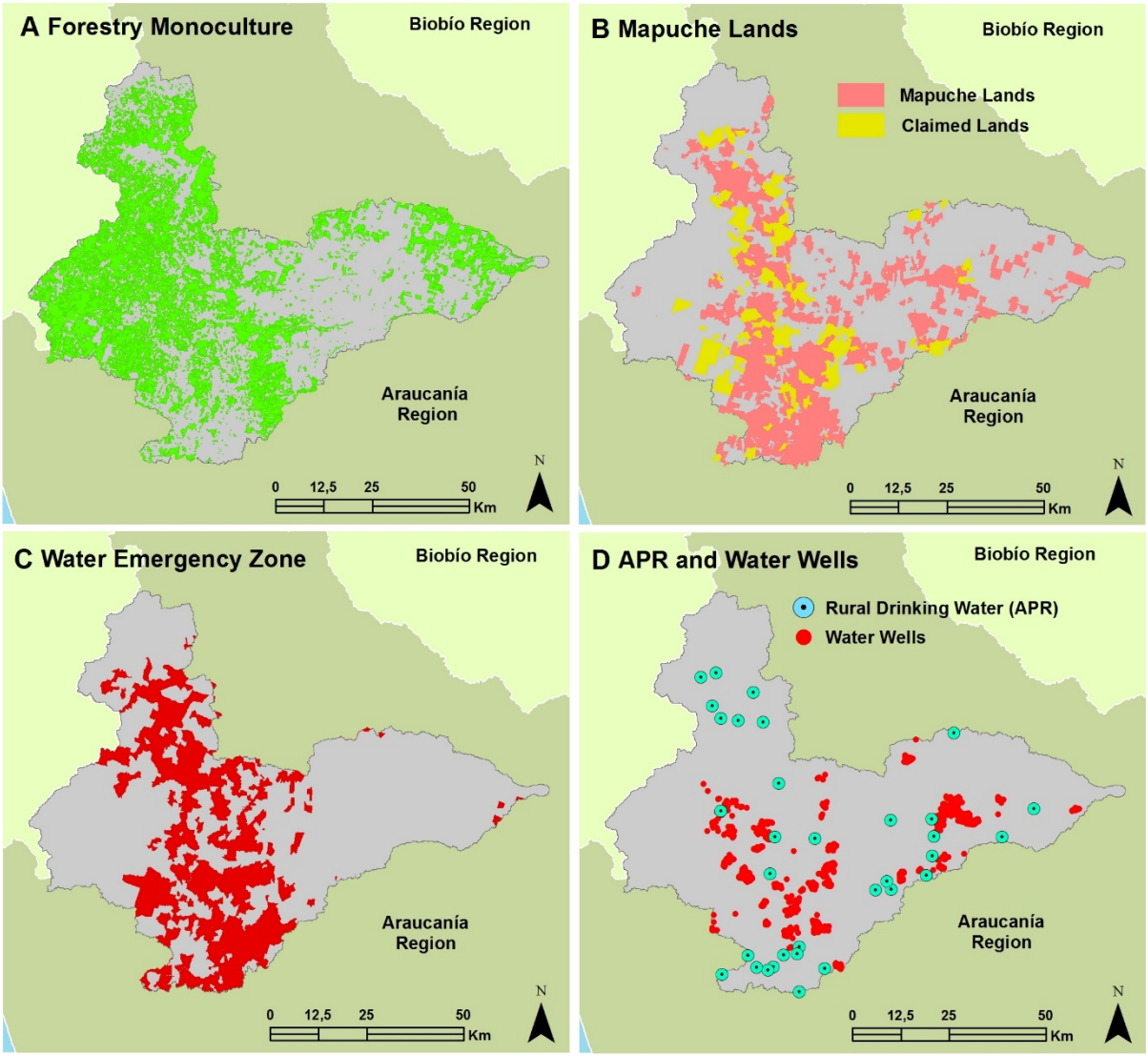
Decolonisation struggles to liberate Mapuche territory from water extractivism

In this section, we focus on the competing social constructions (cf. Forsyth, 1998) and controversies regarding the critical hydrosocial configuration in Mapuche territory. This configuration has been shaped by Mapuche's historical claims for land, autonomy, and now water. A decolonial process contesting the coloniality of nature and of water extractivism has already begun.

Decolonising knowledge: On the epistemic conflict related to the lack of water

The struggles of Mapuche and Chilean peasants living in an area where water extractivism is driven by forestry plantations are both practical and epistemic. Materially, they live below WHO standards and in degraded socio-environmental conditions. In political and cultural terms, they also live under the hegemonic corporate knowledge coming from forestry corporations, backed up by the state and even by some academic researchers (cf. UNESCO, 2019). Essentially, this knowledge argues that there is no relationship between forestry plantations and lack of water. Forestry corporations attribute the lack of water exclusively to climate change and to an increase in water demand (CORMA, 2014). This is the official position of the *Corporación Chilena de la Madera (*CORMA), a major Chilean trade association that brings together about 180 actors from the forestry sector, including Forestal Arauco (see www.corma.cl/socios/).

Figure 4. Water extractivism in the Mapuche lands of the Chol-Chol and Lumaco River basins.



Source: Authors' own elaboration based on Araucanía regional government data, CONADI (2015), and Centro EULA-Chile (2010).

CORMA takes the position that, although plantations use water to grow and produce timber, they are not the cause of the reduction in river and estuary water levels. The main cause is the shortage of precipitations due to climate change, as well as the increase in the demand of water for other uses (CORMA, 2014: 4).

CORMA further adds that in the case of groundwater, climate change is also the main cause of its gradual drying up, since when "average temperatures in the mountain range increase, there is less accumulation of snow in the high peaks, which affects the recharge of aquifers in the spring-summer months" (ibid: 6). The latter is significant because, as stated before, aquifers are the source of water for both noria wells and APRs. According to CORMA, however, the main reason for these aquifers drying up is the small amount of precipitation that has accompanied the recent megadrought and the greater demand for water from agriculture (ibid). CORMA asserts that there is no relation between forestry monoculture and the gradual drying up of wells because, "the roots of the trees extract the greatest amount of water from the first 3 meters [underneath topsoil] and, therefore, the impact is not relevant

when the water level of the wells or norias are at a greater depth". They add that, "in the areas where there are tree plantations, most of the wells, *punteras* and *norias* have water levels below 6 to 8 m, which is a depth where practically no trees extract any water to grow" (ibid). Although all situations are site-specific, this assertion is very dubious because water use by eucalyptus trees is controversial (Albaugh et al., 2013) and this exotic tree can readily source water from 10 metres or more (Christina et al., 2016).

Although extractivist water knowledge denies the socio-environmental consequences of forestry plantations (ARAUCO, 2012; CORMA, 2014, 2015; UNESCO, 2019), scientific and hydrological knowledge in Chile and elsewhere shows evidence of its negative impact on water bodies (see Jackson et al., 2005; Overbeek et al., 2012). Water extractivism by a pine or eucalyptus plantation compared to a native forest, depending on growing/harvest time, would be higher, thus generally increasing water consumption (cf. Lara et al., 2021). Some authors point out that forestry plantations in areas of old natural forests, grasslands or scrubland consume more water than the baseline of native vegetation, thus reducing water production, stream flow, and surface run-off (Scott, 1998; Smakhtin, 2001; Shi et al., 2012; Albaugh et al., 2013; Alvarez-Garreton et al., 2019; Martínez-Retureta et al., 2020). Other studies have shown that the evapotranspiration recorded in basins forested with eucalyptus are higher than those of pine, and that this is due mainly to differences in the growth rate. At the same time, these exotic species have higher evapotranspiration rates than those recorded in areas where there is still native forest (Gayoso and Iroumé, 1995; Granados and López, 2007; Echeverría et al., 2007; Huber et al., 2010).

Rural peasants' and Mapuche communities' knowledge also consider water extractivism to be the main driver of the lack of water from which they suffer in their territories of life. Unlike extractivist knowledge, local knowledge is based on the daily experience of living surrounded by forestry plantations. According to a municipal manager of water trucks,

> The well dries up. I believe that is due to forestation because many people are supplied with surface water that is supposed to be the water used by the eucalyptus. Then, there is no more surface water because the plant is what consumes most of it (Civil servant from the Municipality of Traiguén).

This argument extends to the other communes in the study area. In our fieldwork through the Chol-Chol and Lumaco River basins, in at least 10 out of 11 municipalities, informants argued that forestry monocultures are the main drivers of water extractivism; however, they also recognised that the lack of precipitation has made the situation worse. The discourse of municipal civil servants who are in charge of water trucks is closely related to that of the communities to which they supply daily drinking water. In fact, during ethnographic fieldwork, we observed that this geographic proximity and everyday interaction based on water provision by water trucks had created local knowledge that was held in common between municipalities and communities. For the Mapuche community members interviewed, the rapid development of forestry monoculture throughout their ancestral lands has been the direct cause of what they called the "breaking" of sacred places like the *menokos* (water springs) and the drainage of *chayakos* (water coming from rocks), and *trayenkos* (waterfalls).

> I was born and grew up here, and [in the past] we had a small water deficit but not like it is now. Now, it is extremely dry. I think that the Law 701 enacted by the Chilean state has also affected because [promotes] to forest private and non-private lands. This has also made us lose the groundwater, the *menoko*. Many have been lost due to forestry companies. Nowadays, the ones invading us are the forestry companies. I believe that in different communities, the forestry companies invade us, because we are surrounded here by the Cautín, Millalemu, and Mininco forestry companies. They are large companies. They even dried up some reservoirs they had as rainwater accumulation in the past. Those are the abuses we have had here as a community. (A *Lonko*, or chief, from a Mapuche community, commune of Galvarino).

According to local Mapuche knowledge, the lack of water cannot be explained just by climate change and/or the rapid advance of water extractivism via forestry monocultures in their territory; other cultural and historical factors are involved. For the Mapuche, key to this debate is their territorial dispute with

forestry companies that own plots of land that they are claiming as part of their *Títulos de Merced* allocated by the state between 1881 and 1927 (Figure 4B, yellow plots). Another factor contributing to water scarcity for the Mapuche is the difficulty of accessing communities that have been almost entirely surrounded by pine and eucalyptus plantations. For the Mapuche, it is not only about an epistemic conflict around the reasons for lack of water; there is also the decolonisation process that is required for recovering territorial autonomy and land, as many of these lands are now owned by forestry companies (Figure 4B, yellow plots) (cf. CAM, 2019). In the middle of the megadrought, water extractivism has contributed to deepening the coloniality of nature; it is now also justified by the neocolonial knowledge that is being conveyed by forestry corporations, which further contributes to the marginalisation of the Mapuche and peasant communities regarding their rights to land, water, native forest, and political self-determination. According to the political ecologist Enrique Leff (2014), the big challenge for the Mapuche is that "the decolonisation of their knowledge becomes a condition for their political – cultural emancipation and for the reconstruction of their territories of life".

Decolonising territories of life: Direct action politics and territorial control

As described above, radical or revolutionary members of Mapuche communities burned the first forestry trucks in the commune of Lumaco on 1 December 1997; this was a so-called sabotage, a practice that has been adopted by different communities and Mapuche movements. Between 1997 and 2017, a total of 234 trucks were burned in the Araucanía region (Reyes et al., 2017). The 1997 event prompted a new wave of direct action politics in the long history of Mapuche resistance, who continued to defend their ancestral lands from different colonial projects. A common argument of the Mapuche people with regard to their movements is that the first colonisation arrived with the Spanish empire; the Chilean state and colonos brought in the second colonisation; and the third and most recent colonisation has taken the form of forestry corporations.

Both their recent and long-term cultural memories are associated with colonisation and resistance (Pinto and Goicovic, 2015; Bengoa, 2016; Pineda, 2018); it is therefore not surprising that the Mapuche multiscale conflicts with the state and with forestry corporations revive memories from 1881, when the invasion of Mapuche territory by the Chilean state began. The conflict declined in intensity between 1927 and 1990 (with some intense moments during the agrarian reform); however, since the end of the 1990s, at the scale of the Araucanía region and our study area, the Mapuche communities and revolutionary movements such as the Coordinadora Arauco Malleco (CAM) have declared the forestry corporations their main target and opponent (Tricot, 2013; Pairicán, 2014; Pineda, 2018; Pichun, 2019; CAM, 2019). They operate mainly through direct action politics, such as the aforementioned burning of forestry trucks and machinery,[2] but also by recovering ancestral lands from the hands of the colonos and the forestry companies (Figure 4). One CAM leader declared that "forestry is our enemy, and we are going to fight at all costs to take them out of the territory. That will be our commitment, and that is the commitment of our young people, weichafes [warriors] of the communities" (Interview with Juan Pichun, CAM leader and Lonko of the Temulemu community, Traiguén). Even though the state instituted the Indigenous Law in 1994 and formed institutions such as the National Corporation for Indigenous Development (CONADI), which was created in 1997 to legally transfer the historically dispossessed lands back to the Mapuche, a growing number of Mapuche and non-Mapuche people do not recognise the legitimacy of the Chilean state. Simply put, they argue that the state supports water extractivism through Decree Law 701, promoting forestry plantations and using the state force apparatus to repress the Mapuche people, accusing them of being terrorists for using direct action politics to attempt to recover their lands.

Underneath this historical political conflict for land and autonomy, the epistemic conflict persists, from which Mapuche hydrocosmologies emerge (see also Di Giminiani and González Gálvez, 2018).[3] Since

[2] See their Instagram account: https://www.instagram.com/kimvnkaweychan/?hl=es-la.

[3] For useful parallels and elements on indigenous ontologies about water, see Vogt and Walsh, 2021.

the 1980s, water extractivism has caused the loss of eco-friendly and sacred Mapuche places of occupation due to the planting of pines and eucalyptus, thus beginning the process of drying up water sources with cultural significance (menokos, chayakos, and trayenkos). At the same time, water extractivism via forestry companies and the state depicts land, water, and nature as private property to be exploited, and exported as commodities to the Global North.

In contrast, for the Mapuche, *territorio* (nature) is family; therefore, *Ñuke Mapu* (Mother Earth) is sacred and cannot be for sale. "[A]ccording to the cosmovision, both the river and the *ngen-ko* [water spirit], as well as the springs, lagoons, lakes, seas, are our relatives. We are part of them. Therefore, we cannot be selling to our relatives" (Juana Kalfunao, Lonko of Juan Paillalef community, Cunco).[4] Water extractivism and its techno-economic rationality (Leff, 2019) have been increasingly triggering resistance by radical Mapuche and campesinos. This, in turn, has (again) created a growing militarisation of the territory, especially during the Piñera government of 2018 – 2022, through the so-called 'Comando Jungla' (Vega, 2018)[5] and different 'States of Exception' during 2021 (Cornejo, 2021). In contrast, the Mapuche deploy their ancestral knowledge and cultural rationality – which is based on their cosmovision – to guide their decolonisation process for recovering lands, water, and territorial control; forestry corporations, colonos and the state, meanwhile, argue that Mapuche direct action is terrorism. A radical decolonising process is drawing radical responses from the state.

Decolonising territories of life means recovering land and water, but this is not enough. For the Mapuche, reconstituting their territories of life implies the recovering of their lands; that is also a precondition, however, for being able to reconstitute their cultural practices and ceremonies, such as *Guillatun*. This, in turn, will help them to reconstruct their Mapuche forms of life. To accomplish this, they must recover the native forests that traditionally grew on their land and restore the water held by the land. The decolonising process occurring in Mapuche lands requires grappling with the politics of territorial control; however, it also implies restoring the ecologies and ancestral forms of life of these territories which, by definition, means eliminating pines and eucalyptus. As one Mapuche leader from a Temuco community said in a meeting, "We want Wallmapu to become a jungle again". Although this could not be the case for all of Wallmapu, it is being carried out on a smaller scale, especially in recovered Mapuche lands. The Mapuche's decolonisation struggles seek to restore native forests and natural cycles of water to their lands. In this respect, the recovery of water through replanting of native forest on lands previously forested with eucalyptus has already been scientifically demonstrated in Chile (cf. Lara et al., 2021).

Direct action politics is not the only strategy used by the Mapuche people in their decolonisation process. As exemplified by the march from Lumaco to Temuco in 2006, there are also other Mapuche groups struggling in the institutional arena (see Huenchumilla, 2017; Namuncura et al., 2020) using varied and complex strategies. A growing national-level water social movement has emerged in Chile during the last decade (see Larraín, 2012; Torres et al., 2017); it has the explicit goal of struggling against water extractivism in a decade of megadroughts. This movement, composed of many local movements from all over the country, has begun to create alliances with the Mapuche movement, giving rise to an emergent national water movement.

In light of the social revolt that began in Chile on 18 October 2019 (*estallido social*), and along with other social movements, in 2021 seven members of the Mapuche community were chosen as

[4] This commune is in the Araucanía region, but outside of our study area. We cite this extract because it is a good representation of the Mapuche water cosmovision.

[5] The 'Comando Jungla' is an elite group of the Carabineros Special Police Operations Group (GOPE); they received special training in Colombia to learn about local security tactics in the middle of the jungle, where Colombians usually face guerrillas. In this case, those in the Mapuche resistance are depicted as terrorist guerrillas. See www.biobiochile.cl/noticias/nacional/chile/2018/11/23/invento-de-la-prensa-el-origen-del-comando-jungla-de-carabineros.shtml.

'constituents' (El Mostrador, 2021). They are now preparing the strategy and alliances for writing and enacting a new constitution, a new water code, and the recognition of Chile as a plurinational country. This would give constitutional recognition to the Mapuche people and other First Nations of the country. In this respect, growing alliances between Chilean and Mapuche communities are working together to resist water extractivism and to recover their dispossessed lands, native forests, biodiversity, autonomy, and water. The current processes of the Constituent Assembly and socio-environmental struggles in Chile could thus eventually begin to change decades of water extractivism, redirecting decision-making towards a more democratic, plurinational, and sustainable trajectory. There is potential for "politics of difference" in the sense of Leff (2014, 2019) to construct territories that are more sustainable for life. The Mapuche and Chilean decolonisation processes can meet at this historical moment to collectively construct a new plurinational alliance to stop water extractivism, while meeting the demands of autonomy and dignity.

CONCLUSION

Water extractivism has contributed to water scarcity and has dispossessed people of adequate levels of water consumption in the Mapuche territory of southern Chile. The communities suffering severe water shortages are in the poorest socio-economic strata and are generally located in rural areas; Mapuche communities and Chilean peasants are disproportionately affected. Although the Chilean government and its municipalities are making a huge effort to cope with the water crisis by deploying water trucks, according to the area's Mapuche and Chilean communities this is an insufficient measure. The growing marginalisation of these communities in terms of their access to drinking water has triggered a decolonisation process of the Mapuche people. They are struggling to recover not only water but also land, native forests, autonomy, dignity, and their cultural practices. Water unites all these processes. As the interviews and data from this paper suggest, water extractivism via forestry plantations explains only part of the lack of drinking water. Further research must fill in the knowledge gaps with respect to the relationships between, and feedback loops among, water extractivism, climate change, drought, and lack of drinking water. Research must investigate how these factors, collectively and respectively, are responsible for the water crisis and how they each contribute to disruption and the rise of resistance/decolonisation struggles.

The lessons from this case study in southern Chile highlight the heuristic potential of the proposed concept of water extractivism. First, in Latin American countries water extractivism is closely related to the coloniality of nature and to the historical, political, spatial, and socio-environmental processes associated with production of commodities for export. Second, water extractivism is a relational concept in that it implies an historical-geographical, dialectical analysis of state policies and corporate power and the community responses to those powers. In the Chilean case, state/corporate power facilitates the extraction and export of water via forestry plantations, but also via other types of commodities such as avocadoes (Budds, 2012) and lithium (Jerez et al., 2021). The fact that processes of promoting forestry plantations are similar in Chile, Uruguay, Brazil, and elsewhere in the Global South shows the potential to apply the concept to other territories in a context of water markets (cf. Bauer, 2015). Third, in the case of indigenous and rural people from Latin America, an examination of water extractivism also implies a consideration of decolonisation struggles to recover the water and lands that are oriented to conserving and reproducing their ancestral ontologies and their human right of 'being' and 'existing' differently in the world (Escobar, 2016; Leff, 2014, 2019). This decolonisation process has cultural and ecological implications. The Mapuche case demonstrates that to the extent that they can recover their territory, both via direct action politics and in the institutional arena, they have the potential to restore it ecologically by recovering native forests (cf. Lara et al., 2021). In their hydrocosmological terms, if water returns, it also comes back to the *kgnen-ko,* or water spirits – the guardians of their ancestral lands and

forms of life. An examination of water extractivism and of the associated decolonisation process can thus also contribute to shed light on the internal relationships between culture and water sustainability.

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