



# The Connective and Disconnective Capacities of Water Infrastructure: The Making of Chile's Largest Off-grid Solar Power Irrigation System

*Martine Greek* | Associate Professor in Social Science, University of Stavanger, Norway

**ABSTRACT** Based on nearly one year of ethnographic research on an inland island in Southern Chile, this article examines the construction of Chile's largest off-grid solar power irrigation system on Isla Huapi. For decades, the island's indigenous population has put pressure on the Chilean government to provide basic services of electricity and sanitised drinking water. Instead, in 2012, they were provided with a governmental development project that promised an infrastructural system aimed at transporting water from the surrounding lake to their plots for irrigation. Nevertheless, as the construction process progressed over the next few years, islanders found the irrigation system to be a desirable infrastructural connection as it provided them with water in different forms – irrigation water as well as indoor tap water. In this article, I look at the way in which these forms of water became a site of aspiration as well as a site of political struggle between islanders and state actors (government employed engineers). Analysing water and water infrastructure as political and material forms, I argue that struggles over access to water and the forms that waters take, create different connections (and disconnections) not only between water and islanders but also between islanders and the state.

**Keywords:** Water; connections/disconnections; state; infrastructure; Mapuche

## Introduction

Isla Huapi is an inland island located in the south-eastern part of Chile, surrounded by lake Ranco's fresh water streaming down from the Andean mountain range. The island hosts an indigenous population, formally organised as the indigenous community of Isla Huapi. The large majority of people living in this community are Mapuche people who, according to themselves, populated the island as they fled the terrors of war. Throughout history, Mapuche people have been systematically suppressed and manipulated by Chilean state authorities, most significantly through land loss and displacement in the nineteenth and twentieth century (Bengoa 2001; Di Giminiani 2015). The history of major land deprivation and processes of state discrimination, continuing up until today (Richards and Gardner 2013), has left Mapuche people throughout Chile with little land to make a living and increasingly dependent on the state for their survival. While this history has mobilised many rural Mapuche in current struggles over self-determination, recognition, and the restitution of ancestral territories (Di Giminiani 2015; Richards and Gardner 2013), this is not the case on Isla Huapi. Instead of demanding restitution of ancestral territories and self-determination, islanders demand governmental and municipal spending on material development in the island community. On travels to the mainland, islanders are made aware of the precarious material conditions

under which they themselves live. In contrast to the rural population on mainland, islanders lack access to basic services such as reliable health care, proper roads, sanitised drinking water, and electricity. Often explained with reference to past and present processes of discrimination, the absence of proper infrastructure on the island – electricity and water infrastructure in particular – mobilises Mapuche on Isla Huapi to make demands for state resources. Analysing the process through which a specific infrastructure recently emerged on Isla Huapi, I here look at the way in which water infrastructural development ties in with indigenous islanders' struggle for recognition and argue that the troubled historical relation between islanders and the state reemerge in processes of water infrastructural development.

For decades, the indigenous community of Isla Huapi have pressurised the Chilean government and the municipality to provide basic services of electricity and sanitised drinking water. Instead, in 2012, they were provided with a governmental development project that promised an infrastructural system aimed at transporting water from the surrounding lake to their plots for irrigation. The irrigation system did not seem to be a development project for which they cared much at first. It came to be a desirable infrastructural connection as soon as islanders were made aware that they could use their connection to the irrigation system as a source of indoor tap water – a long-desired amenity. Following the construction of what was to become Chile's largest off-grid, solar-powered irrigation system, I am here concerned with the material and political potentiality that this infrastructure holds.

Based on the aforementioned empirical case, I argue that water infrastructure holds connective capacities in more than one way (Paerregaard et al. 2020). A physical-material connection to the irrigation system creates access to running water for the islanders. Whenever water surfaces through an outdoor water post or through an indoor water tap, this flow allows for renewed belief amongst the islanders, in the government interest to invest in life on the island. Thus, the water infrastructure has the capacity to connect islanders to running water and to the state – to possibilities for human life (Harvey and Knox 2015; Harvey 2018 in Venkatesan et al. 2018). However, as the infrastructure takes form through a series of delays, amidst ruptures and stagnations, and water flows are unpredictable, this connection is never experienced as complete – neither the physical-material connection nor the connection to a caring state. Rather, it is experienced through a series of breaks and disruptions. Hence, infrastructure's capacity to connect always also implies a capacity to disconnect (Orlove and Caton 2010), not just through water infrastructures such as pipes and water taps (Anand 2017), but also through other infrastructures such as roads (Harvey 2018). On Isla Huapi, water infrastructure's capacity to create incomplete and unstable relations between islanders and the state ties in with historical narratives of state discrimination and neglect. In this sense, the infrastructure allows for a relation between islanders and the state that is never quite finished but always in the making.

Inspired by recent anthropological literature on water that approaches the materiality of water and social life as interconnected and mutually constitutive (Ballesteros 2019; Krause and Strang 2016; Orlove and Caton 2010), I explore the material and political conditions through which running water appears or fails to do so. To Franz Krause and Veronica Strang (2016), an analysis that thinks relationships through water examines relations in which water enters – social, material, political, and alike – and considers social and hydrological relations together. An analysis of what they call hydrosocial relationships (see also Ballesteros 2019) thus requires attention to the myriad of relationships into which water enters and the

way in which water affects these relations. Combining recent anthropological research on infrastructures and water (Anand 2011; 2017; Ballesteros 2019; Krause and Strang 2016; Orlove and Caton 2010; Von Schnitzler 2013), I examine the way in which water enters into relationships with islanders, government employed engineers and the materiality of the irrigation system – water pumps, water posts, pumps, and the like – in a quest to examine infrastructural connections. Not only is water supply on Isla Huapi conditioned by physical and political ‘pressures’ (Anand 2011), it is also understood to be conditioned by a political history of discrimination and state neglect against Mapuche people (Crow 2013; Richards and Gardner 2013), in particular, the Mapuche people on the island of Huapi.

The main argument put forward is that historical relations between islanders and the state reemerge with the uneven process of infrastructural development that promises provision of running water. In the first part of the article, I introduce the myriad of relations into which water enters and that demands analytical attention in order to understand hydrosociality on Isla Huapi: hopes for water and state care, material becomings of infrastructure, and political negotiations. I demonstrate the frustration created by these relations, shared by engineers and islanders alike, and proceed to explore different understandings of water needs and the life-altering significance that particular water flows might have. Looking at state connections and a history of discrimination, I turn the analytical gaze towards the relation between hopes for water and hopes for state care, and analyse the way in which narratives of state discrimination tie in with such hopes as the irrigation project allows connection to history through time-space compressions. In the last part of the article, I turn the focus to temporalities of water supply temporal expectations and look at the way in which the uneven emergence of infrastructure create connections to past histories of state violence and the way in which these connections spur political negotiations.

### **Hydrosocial Relationships of the Irrigation Project**

Arriving for a meeting at the island’s school premises, I found Ignacio and Enrique<sup>1</sup>. Ignacio was the head of the regional department of irrigation run by the Institute of Agricultural Development (INDAP). Enrique owned the company to which Ignacio had outsourced the job of completing the project that he, together with his team, had designed, and of which he was in charge. The project was mainly related to the construction of Chile’s largest off-grid (not connected to a central electricity grid), solar-powered irrigation system. This, I understood, would be the topic of the upcoming meeting. Half an hour after the meeting was supposed to start, Ignacio stood up in front of the small crowd of people who had showed up. In a calm, but firm voice, he said that they had called the meeting to update people on the irrigation project. The main network of pipelines, the *red matriz*, as well as the first stage of the project was done, he said. He paused before continuing: “What is missing are permits necessary to get the second stage going”. Talking in a slow manner, stressing each word, he explained that for some families it would be necessary to draw the pipelines through their neighbour’s plots or properties. For Enrique’s company to do this job, they needed permits from the owners of the properties on which they would lay down pipelines. So far, Ignacio said, they had received only a fraction of the permits they needed to do this

<sup>1</sup> Throughout the article, names of interlocutors have been changed and their identities anonymised.

job. The work was planned to start in the beginning of November, which meant that many only had four weeks to obtain permits from their neighbours.

A woman raised her voice telling Ignacio that she faced a problem getting the permit because her neighbour refused to give it to her, assuming that the pipelines would damage his plot and crops. “For this reason”, she continued explaining, “you have to put the pipelines down along the road to my plot instead of putting them down through his land”. Ignacio asked for her name and Enrique, sitting on a table behind Ignacio, started searching in his papers. Meanwhile, Ignacio responded to this woman by saying it would be too difficult and time-consuming to dig up stones in the road and put down the pipelines all the way along the road to avoid her neighbour’s plots. “The only solution here”, he said, “is that you obtain that permit from your neighbour”. The woman got upset, repeating that her neighbour refused to give it to her – what was she to do? Meanwhile, Enrique had apparently figured out what property they were talking about and asked her if this neighbour was not her uncle. She confirmed this but added that he would not give her the permit regardless. Ignacio shook his head and smiled.

Slowly, while looking down, he walked up to the audience sitting on the steps of the bleacher in the school’s gym where the meeting was being held. He crossed his arms over his chest and looked up. Facing the audience, he said with a loud voice: “Listen, here we are all adults, aren’t we, who can talk to each other and find solutions. We [Enrique and I] cannot go around to each and every one and do this job for you”. Ignacio was upset. He was angry. He went on to say that if they did not get the permits before the beginning of November, they would have to find another contractor to do the job that Enrique was now hired to do. This would be a very difficult task, finding a new contractor, considering the small amount of governmental funding that was left to carry out the final stages of the project. It sounded almost like a threat. Continuing in a loud and harsh voice, Ignacio said: “We have done our job, now it is time you do yours. This is not our project, it is yours”, he added before taking some steps back.

Nobody answered. Everyone was quiet. The echo of Ignacio’s voice resounded between the walls of the gym. Then he turned around again and said that few people had shown up for the meeting. Still angry, he asked, rhetorically, where the rest were. There were 95 beneficiaries (*beneficiarios*) of this project in total, but he could only count 20 present. “So”, he said, “the question remains: where are the rest?” Having kept quiet until this point, Enrique now spoke up as well, saying he was tired of people not showing responsibility. Like Ignacio, he was clearly upset: “It is okay for me to repair broken tubes, but when I have to spend money and time to repair broken tubes because people apparently lack interest to take care of the things they are given. With this I have a problem”. What were the preconditions for this emotional outbreak?

Thinking relationships through water (Krause and Strang 2016) would in this case imply thinking relationships through the hope for water. For many islanders, running water had not yet appeared on their plots, nor had the water posts through which the water would surface. Thus, it was the hope for or even expectations that spurred these emotions. Furthermore, the hope for water here enters into relations with materials of bureaucracy, such as the much-needed permits, and materials of infrastructures repeatedly breaking down. Understanding the political negotiations taking place in this meeting, requires attention to the myriad of relations into which hope for water enters.

Writing about hydraulic infrastructure and citizenship in Mumbai, Nikhil Anand (2017) focuses on the myriad more-than-human relations which make up this infrastructure: steel, cement, ‘nature’, laws, social histories, and political practices and, not to forget,

water. Drawing on Dipesh Chakrabarty (2000), Anand seeks to theorise the social life of infrastructure and suggests that it is a “... social-material assemblage that not only constitutes the form and performance of the liberal (and neoliberal) city but also frequently punctures its performances” (2017: 6). As all infrastructural constructs, water infrastructures entangle efforts of modes of government, shaping the role between political subjects and state in specific ways. However, this relationship is never complete. As Anand points out, infrastructure comprises processes always in formation. Infrastructure is not only a material becoming but also a socio-political one.

Understanding political negotiations tied to hope for water that is elicited through the irrigation project also requires keeping in mind historical encounters with development and the scepticism with which islanders for decades have met governmental promises of development in the community. This scepticism stems from past experiences with failed promises or experiences of state carelessness. Recounting the moment when materials for the construction of the irrigation system started arriving on the island, several islanders talked about the relief with which they met this sight. It was not so much that they desired this specific project: rather, it was a token of the government’s willingness to care for the island by fulfilling their promise. They had kept their word. As infrastructural projects hold within them potentiality and hopes for better lives, they also hold within them potentiality of failure and disappointment. Given that unforeseen connections and disjunctions are likely to occur during the life span of an infrastructural project, such projects elicit a range of emotional responses – for islanders as well as engineers.

The meeting described above took place in October 2016. Over the course of the eight months that I had lived on the island, this was the first time that I witnessed Ignacio and Enrique directing their frustration and anger towards the farmers directly. The project had already been stagnating before I arrived in early March the same year. Only the first stage of the project was completed when they were confronted with a technical challenge causing a serious setback to the project’s schedule. The frustrations and tensions related to the construction of the irrigation system had been building up ever since and culminated in this meeting. Ignacio and Enrique were frustrated that the project did not progress as planned and angry that most of the islanders did not seem to put much effort into caring for the technical equipment nor showing up to the meetings that they organised. Consequently, to Ignacio and Enrique, islanders did not demonstrate sufficient enthusiasm for the project in itself. On their part, many islanders did not show up to these meetings because, to them, it was purposeless. After four years in the making, this project had yet not produced the results they hoped for – running water. Many of those who did show up did so to *reclamar* – call for or demand what they were promised but still lacked – running water. Others had grown tired of complaining as in their experience, it did not result in much more than time wasted. Another source of the frustration experienced by the islanders as well as Ignacio, was the fact that they had different waters in mind – the inlanders wanted indoor tap water while Ignacio offered them irrigation water.

### **Different Understandings of Need for Running Water**

The Chilean government initiated the irrigation project to cope with increasing water scarcity, which resulted from decreasing rainfall as a result of climate change. While the farmers of Isla Huapi depend on their agricultural activities, deteriorating harvests is not

their greatest concern. The rainfall they had relied upon for cultivation up until this point still seemed to give harvests sufficient to supplement diets and, through sales in the small village on mainland, household economies. The more pressing water related issue for people on Isla Huapi was the lack of a different water, namely sanitised drinking water. Because of the government's environmental concerns and its particular conceptualisation of water scarcity tied to decreasing rainfall, the necessary adaptations to confront the impact of climate change were made at the expense of the farmers' requests for sanitised drinking water. Nevertheless, Ignacio and Enrique claimed that this was *their*, that is the islanders', project. The irrigation system's infrastructure could not provide sanitised drinking water. Yet, it opened up the possibility of solving another hardship related to water – the burden of having to carry water manually from the lake to their houses.

To mitigate the divergence between the two types of running water, purified drinking water and impurified irrigation water, farmers were encouraged by Ignacio to use the irrigation system as an infrastructural means to transport water into their houses. If not in a purified form, the water was at least transported into their homes. As soon as the irrigation system was up and running and they gained access to the hydraulic network, they could connect self-purchased pipes to the water post in their plots and in this way transport water to their houses through the pipes. In some households, water taps had already been installed and were in use as they had been connected by pipes to wells. However, the wells were too few and benefitted only those people who had one on their own or their neighbour's property. Furthermore, this required great investment in materials, as an overhead water tank was needed to ensure pressure. Thus, most islanders carried water manually on a daily basis and indoor tap water was, regardless of the water's quality as purified or not, in high demand. During community meetings organised by Ignacio to discuss the irrigation project, meetings similar to that in the aforementioned case, a question commonly asked among the attendees was precisely: "what water is he [Ignacio] talking about?" Some of the frustration grew out of the fact that the engineers and islanders who attended these meetings, if only to complain, were concerned with the two different forms of running water. Among them was Rosa.

After her husband died, Rosa, still in her thirties, became a single mother of two, a girl and a boy, now both in primary school. For a while, she enjoyed the company of Alejandro, her boyfriend. He had taken on paid work at the farm where I lived, and it was through him that I had gotten to know Rosa. But after Alejandro's brother died and he took over the brother's farm and additional livestock located further south in Chile. Before leaving Rosa, Alejandro started to build the house where she now lives alone with her two children. However, the house is still unfinished inside – lacking doors, a wall, and a coat of paint. Moreover, without Alejandro, Rosa has no income aside from the sparse state pensions she receives once a month and the little money she earns from occasionally selling bread to other islanders. In other words, Rosa finds herself in a precarious situation.

The authorities have not made Rosa's life any better. Since they began visiting her home the social services have expressed concern whether she is able to provide for her children and questioned the fact that she makes them work. They have also raised doubt about the hygiene of the children's living conditions including the poor quality of the water the family uses for cooking and drinking, which has made access to water and, in particular, sanitised water an urgent matter to Rosa. To understand her situation, one has to consider the daily struggles her life entails, and the prejudices and ignorance Rosa is victim of when outsiders judge her.

Rosa and other islanders find themselves trapped in a stigmatised image of the past. In their view Isla Huapi has undergone significant change in the past years especially with regard to its infrastructural development. The local ferry transportation, for example, enables movement between the island and mainland, thus increasing the contact between islanders and the outside world. Inhabitants of Isla Huapi differentiate between *antes* and *hoy en día*, meaning ‘before’ and ‘nowadays’, and reject preconceptions of them as backward, old-fashioned, or even dirty, physically, or mentally. According to the islanders, this might have been the case before. Nowadays, they told me, islanders are more ‘developed’. To Rosa the social workers who visited her expected her material conditions to be the same as they enjoy. But, Rosa argued, even though her house was not as clean as other people’s homes and even though her drinking water was not sanitised, this did not mean that she and her children were dirty or that she did not know how to keep the house clean. Thus, what compelled Rosa’s complaints was the precarious life situation from which she believed that the irrigation system could offer her some relief – by providing tap water. Without it, her daily struggle with carrying water from the lake, up the hillside to her house, continued. For Rosa, as for other islanders, the irrigation system elicited hopes for progress and modernisation, but also social recognition – for a better life of less hardship, including discrimination.



**Fig.1.** The hillside behind Rosa’s house and lake Rancho from which she fetched water.  
Photo: Martine Greek.

### **State Connections and a History of Discrimination**

In his review of anthropological literature on infrastructure, Brian Larkin notes that “infrastructures are matter that enable the movement of other matter ... They are things and also, the relation between things” (2013: 329). They bridge distances and allow for time-space compressions, which can be understood as connections. On Isla Huapi, the

irrigation infrastructure holds the potential of connecting the island's inhabitants to the modernised outside world – a desirable connection. This would allow for islanders to experience a sense of recognition of their demands for development and a recognition of them as citizens equally deserving of state care through material development as those living on the mainland. However, to islanders, the irrigation system also allows for another type of time-space compression. In the past, other plans for material development failed. For example, on several occasions, I was told the story about the government's plans to invest in an underwater cable through which the island would be supplied with electricity. The money was even allocated. The hopes were high until they learned that the money earmarked for this project were reallocated and spent elsewhere. The project had proven too expensive. Islanders claimed that broken promises of development, such as the abovementioned, were examples of discrimination against them as Mapuche people that fed into a history of state neglect – a history that dates back to the beginning of the nineteenth century and which Mapuche people still carry with them.

When Chile gained independence from the Spanish Crown (1810-1818), the Chilean authorities started the process of confiscating and colonising large areas of the south. Chileans took an interest in Mapuche people's land, forested areas from the Bío-Bío River in the central valley of Chile to the very southern parts of the continent, which they wanted to use to extend the nation's agricultural production. In addition, there was a growing interest among Chilean authorities in unifying the Chilean territory. The subsequent occupation, usurpation and penetration of Mapuche territory (see Bengoa 2001) was legitimised by notions of the Mapuche people as barbaric, uncivilised, and unable to exploit their land properly (Richards 2013). In the mid-nineteenth century, the first tracts of confiscated land were auctioned off by the Chilean state to European settlers. Mapuche people previously living on this land were confined to so-called *reducciones* – reservations scattered throughout the southern regions. The resettlement process took place through allotments of collective land titles (*títulos de merced*) – property deeds. The invasion of Mapuche territory by the Chilean army and the subsequent resettlement process became known as the 'Pacification of Araucanía' (1860-1883). The process left the Mapuche people with only five per cent of their original land (Crow 2013), as the reservations amounted to approximately 500,000 hectares in contrast to the original ten million hectares of the prewar Mapuche region (Di Giminiani 2015). By displacing Mapuche people and introducing new notions of land, the Chilean government attempted to assimilate and control Mapuche populations throughout Chile. The way in which they were subordinated to the larger society of European-descended Chileans, in public discourse as well as in the sphere of national politics, left them both economically and politically marginalised. Due to these processes of displacement, as Mapuche people fled the war, Isla Huapi became inhabited. In the beginning of the twentieth century they were given property deeds documenting their right to Isla Huapi, an inaccessible island where modern infrastructure is expensive to develop.

As islanders draw on narratives of state discrimination, the irrigation project allows for a time-space compression that connects them to memories of a careless and even violent state. Still, instead of demanding autonomy or restitution of ancestral land, islanders call for the state's presence. With regard to hopes for development, they are eager to connect to the state as a provider of much needed resources, and as such, a provider of social recognition. In that regard, hopes for infrastructure to materialise and running water to appear coincide

with claims to state care. However, time-space compressions allowed by infrastructure do not make connections in an even and stable manner. The uneven temporality of the emerging infrastructure and in particular, the uneven temporality of material-physical connections to the irrigation system, done over a series of project phases, causes a series of disconnections. Hope for running water weakens and running water supply is deeply entangled with notions of unfairness that spur political negotiations. The irrigation system, through which these negotiations take place, becomes a site of ongoing political contestation that connects islanders and the state through an unfinished relation with historical ties.

### **Temporalities of Water Supply**

The unfinished relation between islanders and the state, based in a history of hopes and disappointments alike, is reinforced through the irrigation infrastructure as efforts are made to make water flow. Hence, the process by which irrigation and indoor tap water emerged was experienced as unpredictable and uncertain. It is a politically ambivalent, but also a temporally uneven process. The process of making water flow in particular ways is made uneven by political negotiations but also by the unpredictable qualities of water itself. Additionally, the process of making water flow in particular ways is uneven because infrastructure takes time to emerge. If we pay attention to this time and “think of infrastructures as unfolding over many different moments with uneven temporalities, we get a picture in which the social and political are as important as the technical and logistical” (Anand et al. 2018: 17). Over which moments did the irrigation infrastructure on Isla Huapi unfold? As with other infrastructure projects (see e.g., Anand 2017; Harvey and Knox 2015), the irrigation project was carried out over a series of delays, ruptures, and stagnations. Running water relied on a complex system of pipes, tubes, water basins, water posts, and other materials making up the infrastructure. It also relied on the bureaucratic processes of formal permissions and other documentation. Moreover, it relied on the processes of negotiations – between engineers such as Ignacio and islanders as well as between islanders themselves. In what follows, I will look at the way in which the water supply emerged unevenly through multiple phases, and thereby affected the relationship between Ignacio and the islanders, and, in turn, affected the way in which islanders perceived state care.

During my first meeting with Ignacio, in early March 2016, he explained the basic technological aspects of the irrigation system they were constructing. In principle, the project had been completed but some problems remained to be solved. The water level in the surrounding lake had declined to such a degree that two of the accumulators pumping water from the lake up into the system were no longer working. At the moment, he told me, the pumps that were supposed to be completely submerged were literally hanging in the air above the water surface which caused Ignacio’s department additional work as it had to find financial support as well as a work force to rebuild the construction. While this problem was both technically and financially solvable the social issues arising from the postponement of the project’s completion date had become Ignacio’s main challenge. According to Ignacio, islanders did not understand the technicalities of the construction process and had started complaining. And even though Ignacio had offered explanations in a simple language as he expressed it, islanders did not grasp for example, how the system could work without batteries to store the energy that the solar panels produced – that it was a system that operated ‘automatically’, as he said.



**Fig. 2.** The water pumps hanging in the air above the water surface, making it impossible for the water to enter the irrigation system. Photo: Martine Greek.

Another issue of contention was the process through which people gained access to the irrigation system. The project was designed to be executed in three stages. The first stage involved building the infrastructural technology and connecting it to the plots of 29 farmers. The rest of the farmers on the island were to be incorporated in the second and third stages. Before I arrived on the island, contractors had installed three solar-panel stations on different sites on the island. These solar panels, operating automatically, that is, without energy storage, provided two accumulators, one on each side of the island, with power to pump water from the lake into the four dams. These water dams had been built at different sites on the island – all mountaintops. A rather significant difference in altitude between the sites of the water dams and the plots, was necessary in order to transport the water – it had to flow. Leading out from the bottom of these water dams was an intricate system of subterranean pipes spanning across the island – the main network. To the main network of subterranean pipes, new pipes were connected – also underground. The latter sets of pipes (like arms attached to the main body) carried water running in the main network down to various farmers’ plots. Here, the water surfaced anew through water posts. Each property was to have one water post. When I arrived on the island, the first stage of the project had already been completed: 29 families’ plots had been provided with water posts and connection to the main network of underground pipes. The second stage of the project, which they started working on while I did fieldwork, was to provide another group of farmers, the second group, with the same connection. The third and final stage, in which the remaining unconnected farmers on the island will gain access to the hydraulic network, was still in the planning phase, which caused discontent among the affected people who indignantly told Ignacio: “¡no hay agua!” – “there is no water!” In their view, the project’s delay, and the waiting problems it entailed disclosed a political issue as it left them as the only islanders without running water in their homes.

On the other hand, Ignacio explained the delay as a technical and unforeseen problem attributing it to his professional team's failed calculations of fluctuations in the lake's water levels. For a long period, the accumulators pumping water from the lake into the system of underground tubes on the island, had been left hanging in the air above the lake's surface until Ignacio and his team reinstalled the accumulators deeper down. Ignacio also attributed the low levels of water in the lake to the reckless water extraction by large-scale businessowners in the surrounding area. In a similar technical vein, he interpreted the islanders' repetition of the same questions and statements such as *¡no hay agua!* as proof of their low educational levels. According to Ignacio there were other examples not only of the islanders' ignorance, but also their lack of collaboration and appreciation of the project's importance. Apparently, destroyed water posts as well as ruptured and cracked underground pipes were common finds during regular inspections, and demanded repair. The damage to the infrastructure was commonly caused by the activities of heavy and fierce cattle grazing where the water posts were. Such experiences affirmed Ignacio's and his co-workers' belief that there was a communication barrier caused by lack in formal education which, in turn created social discord, complicated his job, and delayed the project's completion. Repeatedly due to what Ignacio conceptualised as social issues but nevertheless addressed as technical problems, he had to revise his financial calculations and the project's time schedule.

Infrastructure is, as Akhil Gupta approaches it through his focus on the relation between infrastructures and their futures, a process "characterised by multiple temporalities, open futures, and the constant presence of decay and ruination" (Gupta 2018: 62). The divergence between temporal expectations for infrastructural building initiatives as planned projects on the one hand, and as an open-ended process on the



Fig. 3. A water post sticking up from the ground. Photo: Martine Greek.

other, is partly what causes the frustration experienced by Ignacio, Enrique, and the islanders themselves. As Penny Harvey (2018) points out in relation to road constructions in Peru, the promise of infrastructure as the result of singular projects is tenuous. They might be perceived, at times even expected, to take place on the ground as single operations. In reality, however, infrastructural projects do not take place in a linear fashion, nor in the form of a single operation. Rather, "what emerges on the ground appears in fits and starts. Some aspects of a project appear long before others, while some components of a system might begin to fail or decompose before others have even begun" (Harvey 2018: 82). The irrigation system on Isla Huapi, perceived and presented as a singular project, revealed itself to consist of a multitude of different ones that emerged at different times. The ongoing infrastructural maintenance frustrated Ignacio because he, like the islanders, understood the infrastructure

to be a linear process which steadily progressed towards an end point: the completion of the infrastructure, and thus of the project itself. However, infrastructural projects repeatedly prove to be open-ended works-in-progress.

Returning to the meeting with Ignacio and Enrique, the engineers of the irrigation project, the issue at hand for them was the islanders' seeming unwillingness to take responsibility and to do what they considered their part of the job – to obtain permits from their neighbours and care for the infrastructure. In addition, the governmental funding was about to run out and the situation was to them indeed frustrating. However, his frustration had piled up over several months, during which he had encountered one obstacle after another. This was not how Ignacio had expected the project to proceed. Instead of addressing the unequal distribution of resources or politics of water supply, Ignacio explained the problem by complaining of islanders' actions (or lack thereof) through their lack in formal education. In fact, he was thereby foregrounding stereotypical, racialised imaginaries about the Mapuche people as 'backward' and as 'lazy' lacking a proper work ethic (Crow 2013; Di Giminiani 2018), an image that Rosa's case undercuts.

Anand (2017) demonstrates how citizenship emerges through the continuous efforts to control, maintain, and manage the city's water systems – its infrastructure. Like Anand (2017), other anthropologists have studied the relationship between people and the state through a focus on the social life of infrastructure, for example Antina Von Schnitzler (2013, 2016). In her book, *Democracy's Infrastructure* (2016), Von Schnitzler focuses on conflicts surrounding prepaid water meters in post-apartheid South Africa. Instead of focusing on negotiations of citizenship, she explores the ways in which democracy takes shape in the form of techno-political devices including meters to measure water consumption and the political subjects these generate.

Examining negotiations of citizenship through social histories offers a fruitful entry to understanding political negotiations of water access on Isla Huapi as well. Through prospects of a better life and experiences of uneven distribution of water, between people on the island and those living on mainland but also between islanders themselves, the always emerging irrigation system spurred political negotiations that contested notions of equality and social recognition.

## Conclusion

The response of Rosa and others in her situation to the prospects of being connected to the irrigation project must be viewed in the light of their precarity and the unequal distribution of water among the island inhabitants. It was therefore the hope for running water and the social recognition/life/status associated with it that compelled many islanders, including Rosa, to complain and complicate Ignacio's work. Even though the infrastructure had been built on her property no water was running through its pipes because of the uneven water connections, which explains Rosa's and others' disappointment.

Analysing hydrosocial relationships thus implies paying attention to the myriad of relationships that links water to its human users. On Isla Huapi, this requires examining the hope for progress materially as well as socially that access to water creates. A past and more recent history of state neglect and governmental indifference towards islanders, living on an inaccessible island where infrastructure is expensive to develop, has made many question the

government's willingness to care for them. The state's failed attempts of material development over the last few decades has reinforced this doubt. When irrigation infrastructure finally materialises on the island, together with engineers and other technical staff employed by the government and municipality, the hopes for running water increases in tandem with hopes for recognition.

When studying development of water infrastructure as a relational process that includes and enacts not only the material but also the social and political, and the uneven temporality through which infrastructure emerge, troubling historical relations between islanders and the state are revealed to be reemerging together with the infrastructure. In that way, I have argued, not only does water infrastructure have the capacity to connect in a socio-material sense but also in a socio-historical sense. For people on Isla Huapi who are still seeking social recognition through governmental development, this means that the water infrastructure connects islanders and the state in a highly ambivalent relation. The confusion caused by divergent understandings of which types of water that matter on Isla Huapi and in what ways – irrigation water versus tap water or versus sanitised drinking water – underlines the different ways in which infrastructure connects and disconnects islanders and the state. To understand the many processes through which this infrastructure develops as an irrigation system *and* a system facilitating indoor tap water, means to explore not only material, socio-political relationships and the temporality of these relationships but also the daily lives and social struggles of the people who engage in them.

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