

Appendix 2. Selected materials from in-depth interviews and documents for the first, second, and third controversy

First controversy: the truth of stranded shellfish

The *first controversy* refers to the poisoning of seawaters and the massive stranding of shellfish at Chiloe’s seaside. Table A2.1 presents controversial sentences explaining the stranding of shellfish through the ‘poisoning of waters’ either as a consequence of the pollution produced by the salmon industry or as a natural consequence of harmful algal blooms. For the detail of sources, see Table A1.2.

Table A2.1 Controversial sentences from in-depth interviews on the topic ‘poisoning of waters’ (including selected material from key documents)

Sources	Contents understanding the poisoning of waters		Sources
	<i>as a consequence of pollution produced by the salmon industry</i>	<i>as a natural consequence of harmful algal blooms</i>	
Social organisation 2	You can’t go to the beach because it’s poisoned. It’s as if you suddenly become blind and deaf [...]. This wasn’t the nature; it was on purpose.	There was an algal bloom. Why? Because algae depend on water temperatures. Look how much it has rained in the south lately. Today there is 50% water deficit.	Scientific organisation 2
Activist organisation 1	Coasts are full of polystyrene foam and metallic structures coming from the salmon industry.	This was the worst toxic outbreak of the paralyzing toxin in Chile, the largest in Chiloe. And now the next toxic outbreak will come.	Scientific organisation 1
Social organisation 1	The Chilote sea is highly contaminated; you have to invest a lot to improve it [...] Pollution comes from many years ago [...] We saw miles of dead seafood, dead whales, dead fish, dead birds. We did not have to eat. That is shocking.	These toxins do not appear at any time of the year. This happens in Chiloe always between February and May. This time with the ocean tension it was longer, but it also began in the same months of summer.	Scientific organisation 1
Fishing organisation 3	They have not only polluted the sea by bringing here the red tide with their ships. They have polluted the sea with antibiotics, contaminating the native fauna with faeces, antibiotics, traces of tires and an immense amount of garbage.	We cannot eradicate what is already present in these coasts and that is precisely the harmful algae that at some point is going to re-trigger.	Political organisation 1
Fishing organisation 7	We are upset with the overexploitation led by salmon farmers and with seeing how they throw the dirt at the door of our house [...] it is disrespectful towards our people [...] Today	The salmon died, but what happened? They say, “Hey look, with the dumping, they fed the catenella”. But it has nothing to do. It was proved that changes in temperature, light	Scientific organisation 2

	we have a tremendous crisis because the salmon industry poisoned the sea and impoverished the culture of our people over years.	conditions, triggered everything.	
Activist organisation 2	Look what's happening. This is serious; they are throwing thousands of tons of rotten fish with antibiotics, with acids into the sea. Something horrible is happening.	The toxic algae (<i>Alexandrium catenella</i>) are endemic to that area. It has always been there, since the sixties. It began in the region of Magallanes. The problem is that it has expanded, but they always have these algal blooms.	Scientific organisation 3
Greenpeace Report	Salmon in the process of decomposition produce high amounts of ammonium (NH ₄), which corresponds to the nutrient and 'favourite' food of the microalgae, particularly dinoflagellates (which can generate toxic bloom or 'red tide'). The dumping, consequently, acted as a fertilizer for the algal bloom, stimulating the development and growth of these microalgae.	Since that time [1972], and over the last decades, cells and high concentrations of the toxin known as Paralytic Shellfish Poison (PSP) have spread along the coast of fjords and channels of southern Chile, from the southern end of Magallanes (55° S) to the south-central coast of the island of Chiloé (41° S).	Final Report Red Tide Commission
Crea Foundation Report	The high density of salmon in farmer cages, the dumping of pellets into the sea, the organic waste from salmon and the large quantity of antibiotics supplied to them, generates an environmental imbalance that affects not only living systems, but also the local economy based on the small-scale exploitation of seafood.	We can mention the following scientifically backed factors that affect and promote the algal bloom: global warming, acidification, an extreme El Niño phenomenon and eutrophication of inland waters [...] The only thing clear with this microalgal bloom is that it is NOT a local scale phenomenon and less of a local origin.	Declaration Marine Biologists

Second controversy: the dumping of dead salmons

The *second controversy* refers to the causes of the red tide. Table A2.2 presents controversial sentences explaining the red tide either as a consequence of the dumping of dead salmons in Chiloe's offshore or as a natural consequence of climatic conditions. For the detail of sources see Table A1.2.

Table A2.2 Controversial sentences from in-depth interviews on the topic 'red tide' (including selected material from key documents)

Sources	Contents understanding the red tide		Sources
	<i>as a consequence of the dumping of dead salmons</i>	<i>as a natural consequence of climatic conditions</i>	
Social organisation 2	The worst thing they did was to feed the crisis by dumping the salmons near to Ancud. It was not 20 miles away, as they said, but much closer. That caused another outbreak of the red tide.	You realize it has to do with global warming. The salmon have nothing to do with this.	Scientific organisation 2
Activist organisation 2	I do not think there was as much red tide as they said, because it started after the dumping. I think that someone said: "Ah, let's say there is a red tide, so people do not eat as much sea food because we dumped the salmon into the sea".	The red tide will always be here. And with changes of sea temperature, there will always be red tide.	Political organisation 2
Commerce organisation 3	Over time it was understood that what happened was not red tide, but the infection of the sea by the dumping of rotten fish authorized by Sernapesca, out there in Ancud.	The dumping of dead salmon had no responsibility for the algal bloom.	Scientific organisation 3
Fishing organisation 3	Welboats brought the red tide to our region. It was there, present; only the food was lacking. It had luminosity, temperature; it had the entire atmosphere that would make the red tide burst. It lacked the food and the food was the salmon with the chemicals, with all the things they injected into the salmon. They threw them into the Pacific Ocean and fed the red tide.	The problem is the people and their cultivation techniques. For example, if a person comes from the south and brings water weights in the boat, the water comes with sediments that precipitate in that place and are dragged by the current. That is why sediment was found in the sea of Chiloe. How does it happen? Under particular environmental conditions the harmful algae proliferate and generate the red tide.	Political organisation 1
Fishing organisation 4	We had in some sectors up to 1,800 micrograms of toxin per shellfish. It was the authorized dumping of millions of tons of products in the water, without precaution and with chemicals, what overheated the waters.	The dead salmon could not reach the coast. Algae had already bloomed at seaside before the dumping. Do you understand me? There is no causal relationship.	Scientific organisation 3

Fishing organisation 2	<p>The Seremi [regional Ministry] of Fishing, the Seremi of Health, the National Director of Sernapesca, and the National Director of the Subsecretary of Fishing should be denounced. They ordered the fish to be dumped into the sea. If they had observed the dumping regulations, nothing would have happened.</p>	<p>You need to have good practices, but they just sometimes make mistakes. That makes algae spreading to other places.</p>	<p>Political organisation 2</p>
Greenpeace Report	<p>When analysing the superficial speed of the sea, it is possible to observe that the displacement from the dumping point was toward the south and not towards the north. Therefore, the circulation pattern of the spill and residence times were affected, making them available as food for the microalgae already present [...] In the outer sea of Chiloe the bloom is 5 times more intense than in the interior sea. More than 30 different types of microalgae were found, 5 of them potentially toxic, such as Alexandrium catenella.</p>	<p>The wind conditions observed in March-April 2016 and the expected circulation pattern, further aligned with the sea surface temperature patterns and geostrophic currents derived from satellite measurements for the same period, suggest that the transport of water and suspended material during and after the dumping of salmon occurred mostly from east to west (out to sea) and from south to north. Therefore, it did not come to the island of Chiloe.</p>	<p>Final Report Red Tide Commission</p>
Crea Foundation Report	<p>The environmental pressure caused by growing salmon densities without the necessary sanitary considerations is related with faecal and unconsumed food being artificially incorporated into the environment. Carbon and phosphorus accumulate under cages, while nitrogen is dissolved in the water column. These non-natural contributions date back more than 20 years. This is why the scenario of eutrophication and loss of oxygen in the coastal waters of Chiloe is undeniable.</p>	<p>The evidence gathered from climatic, meteorological, oceanographic, and biological information analysed by this committee, obtained from both national and international public sources and from the cruise, allows us to conclude that the dumping of salmon at 75 nautical miles west of the coast of Chiloe, has no direct relationship with the harmful algal blooms in the region.</p>	<p>Press release Red Tide Commission</p>

Third controversy: the meaning of mobilizations

The *third controversy* refers to the meaning of mobilizations. Table A2.3 presents controversial sentences explaining mobilizations either as a consequence of historical disappointments (longstanding social problem) or as a particular problem of unemployment (short-terms problem). For the detail of sources see Table A1.2.

Table A2.3 Controversial sentences from in-depth interviews on the topic ‘mobilizations’ (including selected material from key documents)

Sources	Contents understanding mobilizations		Sources
	<i>as a longstanding social problem</i>	<i>as a short-term economic problem</i>	
Fishing organisation 10	Of all the historical promises that have been made to Chiloe, concerning improvements in education, health, and social issues, little has been done so far. Too much promises from governments but very few concrete things to improve living standards of a community that has been hit by so many phenomena, both natural and social.	People in public positions, who have to do with the decision-making, are always pointed out as responsible. And it is rather the system bureaucracy that delays everything. When the problem occurs, the person needs to be given a relief solution.	Political organisation 1
Social organisation 2	Chiloe has never been considered with a look that respects its worldview and particular history. It is treated exactly in the same way as any other territory in the country. This is reflected in health, housing, and connectivity policies. That is to say, the same scheme of development is applied. The local viewpoint is not considered.	The downside is that they are accustomed [Chiloe inhabitants] to going out on the streets when there is a problem, and this is not the idea. The idea is to dialogue first, and see if there can be a solution.	Political organisation 2
Social organisation 1	There is a major problem. And nothing has been done [by the government] in the last thirty, forty years.	Efforts were made to deliver boxes with food and [to transfer] the bonus given by the government. I think these things are solvable. But when it comes to environmental issues, pollution and the like, I think things are more difficult to solve.	Political organisation 2
Commerce organisation 2	If one analyses those 17 days, what did fishermen get? Nothing but a bonus. And when I say nothing, it's nothing. I think bonuses are not the solution. It is like giving ‘gifts’. It has no impact because the ‘gift’ is gone after three or six months.	We put into place the contingency plan with the government: the bonuses. We take a heavy toll by employing many people through programs and direct projects. Three hundred million pesos were executed for the employment of three hundred people.	Political organisation 1
Social	Leaders of Ancud are not able to agree with the leaders of	We are doing roundtables with the health sector to be able to	Fishing

organisation 1	<p>Quellon, and much less with those of Castro. Finally, these groups are articulated with their political sectors, with their traditional logics, and negotiate demands individually. If one looks at the demands of negotiating groups, they are highly transversal, but it is impossible for them to agree upon the most relevant demands of the Chiloe archipelago as a whole. Instead, the particularities of more powerful groups gain significance, that is, little relevant issues that have nothing to do with the real problems.</p>	<p>apply health regulations to other companies and also to raise awareness about the control of companies and ships that can bring pollution to Chiloe.</p>	organisation 4
Fishing organisation 7	<p>We continue at the roundtable. In all the meetings the same thing is repeated: the Chilean State has not fulfilled the work [...] The [State] did it well: it divided the fishermen's movement, it separated them into little groups, it negotiated independently with each sector. It gave less to some and more to others. The State did the job cleverly.</p>	<p>The roundtable continues to work until today, but in a more relaxed way. In that sense, we did not fall asleep. Each one makes his/her efforts to make the roundtable work. Things are going relatively well in that regard.</p>	Fishing organisation 5
Declaration of artisanal fishermen	<p>The harmful algal bloom requires serious and responsible courses of actions from the government, so that it takes into account that we are dealing with a catastrophic mega-event with long-term social and economic effects.</p>	<p>We as a government have opened the dialogue. We have tried to find agreements on this matter but we have to think about those affected people who have no income [...] The bonus is a concrete announcement with a payment procedure and potential beneficiaries. We hope it will be paid in the coming days.</p>	Ministry of Economy press release