

Developing the Chilean Salmon Farming Industry



Overview

Through a partnership with Japan, one of the main export markets for salmon, Chile has developed a highly successful domestic salmon farming industry as a strategy to boost economic growth and alleviate poverty. By introducing new salmon farming technologies, creating a supportive legal framework, and building a global market for Chilean salmon, Chile has become the world's second-largest salmon exporter, after Norway. However, the industry's rapid growth has taken an environmental toll, and reforms have become necessary to ensure the long-term sustainability of salmon farming as a major contributor to Chile's economy. This delivery note analyzes some of the delivery challenges Chile has faced in growing its salmon farming industry over the last five decades.

Key Contextual Conditions

Many families in southern Chile have long lived off a mixture of agricultural and fishing activities, but until the 1960s, the region had few major industries to drive economic growth. With insufficient economic opportunities available, many young people left the region to seek better lives in cities.

In the 1960s, the Chilean government began introducing salmon to the region to help lift small-scale fishers out of poverty by allowing them to catch fish of higher value. That intervention led to a series of initiatives to develop the Chilean salmon industry conducted between 1969 and 1989 by the Chilean and Japanese governments (the Japan-Chile Salmon Project).

In Japan, consumers demand large volumes of high-quality salmon, and at the time the Japan-Chile Salmon Project began, the Japan Fisheries Association (JFA) was looking for new ways to procure the sought-after fish. The JFA saw Chile as an ideal country from which to source salmon due to its abundance of clean water and relatively inexpensive labor. Therefore, it was in both countries' interests to collaborate on the project.

Because the Japan-Chile Salmon Project took place under the auspices of the two governments, the new technologies developed in the course of the project were treated as public goods and made freely available. Fundación Chile, a foundation created in 1976 by the Chilean government and a United States-based corporation to foster business growth through technological innovation, played a pivotal role in the technology diffusion process and provided significant technical assistance to private firms.

Development Challenge

The development challenge was to boost economic growth in Chile by growing the salmon farming industry in a sustainable manner.

PROJECT DATA

SECTOR:

Agriculture/Aquaculture, Environment and Natural Resources

DEVELOPMENT CHALLENGE:

Economic growth

DELIVERY CHALLENGES:

Skill transfer, weak private sector, lack of existing regulation, stakeholder engagement, reporting and supervision

COUNTRY:

Chile

REGION:

South America

PROJECT DURATION:

1969–1989

This note was produced by Blair Cameron.

For more information on this project, see: Hosono, Akio, Michiko Iizuka, and Jorge Katz. 2016. *Chile's Salmon Industry: Policy Challenges in Managing Public Goods*. Tokyo, Japan: Springer.

Addressing Delivery Challenges

Skill transfer. To develop the farmed salmon industry in Chile, companies and farmers had to learn the skills necessary to rear farmed salmon and take up new technologies and adapt them to the Chilean environment. Farmed salmon are carefully reared in freshwater tanks and sea cages, and farms have to manage the salmon's feed and inspect them for diseases throughout the salmon's life cycle (one to three years). During this process, local climatic, geographic, and environmental conditions can greatly affect the growth of the fish. Access to high-quality eggs and feed are also critical for salmon farms to be successful (IADB 2016).

Through the Japan-Chile Salmon Project, equipment and supplies were transported to the remote areas chosen as good sites on which to build Chile's salmon industry. Using trial and error, those involved adapted the new technologies to local conditions. Through the Japan-Chile Salmon Project, equipment and supplies were transported to the remote areas chosen as good sites on which to build Chile's salmon industry. Using trial and error, those involved adapted the new technologies to local conditions (Hosono, Iizuka, and Katz 2016).

Over the course of nearly two decades, the project facilitated visits to Chile for more than 50 experts from Japan. These experts transferred a wide range of skills and knowledge on salmon farming to their Chilean counterparts.

The project made strategic efforts to boost knowledge and enhance technology to promote the long-term growth of the industry, such as developing technologies for controlling diseases and creating quality feed. Initially, the private sector was hesitant to invest in these areas because of the high up-front cost and the uncertain return on investment.

Particularly noteworthy was the project's initiative to help Chile develop its own source of high-quality salmon eggs. Until the late 1980s, Chile depended on eggs imported from the United States, which caused problems such as the introduction of fish diseases and instability in the supply of eggs. In 1988, the Japan-Chile Salmon Project began developing technologies for domestic egg production, paving the way for Chile to establish new sources of salmon eggs and reduce its reliance on egg imports.

Weak private sector. To realize the full economic benefits of expanding salmon production, Chile had to build a global market for its product. Doing so required the industry to secure distribution channels, meet quality standards, cater to market preferences, and establish Chilean salmon as a brand. As salmon was a relatively new industry in Chile when the project began, existing private firms were small, and significant investment in marketing was required.

Because Japan was one of the world's biggest importers of salmon, it was particularly important for Chilean firms to cultivate the Japanese market. Chile's Export Promotion Bureau (ProChile) and Japan's External Trade Organization (JETRO) both helped facilitate the salmon trade between the two countries. In other countries around the world, commercial attachés at Chilean embassies (who doubled as ProChile representatives) worked to boost demand for Chilean salmon.

Fundación Chile was crucial in proving to the private sector the viability of salmon farming operations in Chile. In 1982, the foundation established Salmenes Antartica, a salmon farming company, and by 1988, the firm was producing 1,000 metric tons of salmon per year (Mendez and Munita 1989). That year, Fundación Chile sold Salmenes Antartica to Nippon Suisan Kaisha, a Japanese firm. Nippon Suisan Kaisha was one of Japan's major fisheries, and it had extensive knowledge of the Japanese market. After buying Salmenes Antartica, Nippon Suisan Kaisha invited buyers from large retailers and restaurant businesses in Japan to Chile, showed them around, and demonstrated to them the safe and stable supply of salmon farmed in Chile. Exports of Chilean salmon to Japan grew exponentially in the years following, reaching 32,000 metric tons annually in 1993 (Sakurai 1995).

Salmon exports to the United States also increased throughout that period, and in the mid-1990s, the two countries accounted for more than 90 percent of Chile's salmon exports. This dependence on just two markets made salmon farming companies in Chile highly vulnerable to any changes in prices or consumer preferences. In response, firms began building alternative markets by promoting Chilean salmon in Latin America and other regions. By 2007, the firms had been partially successful, but more than half of Chilean salmon was still exported to the United States and Japan.

Lack of existing legislation. In the first years of the Japan-Chile Salmon Project, the Chilean government had no regulatory framework or law enforcement mechanisms to oversee the salmon farming industry, and the government relied on salmon farms to self-regulate their operations. In 1978, the government created an Undersecretariat of Fisheries, which began establishing relevant laws, but it was not until 1991 that the government instituted a General Law for Fisheries and Aquaculture. Further laws on the use of Chile's coastline and a national register for aquaculture activities were established in the mid-1990s.

In the second half of the 1990s, when Chile ramped up efforts to sign bilateral trade agreements, attract foreign direct investment, and increase exports, it came under pressure to create sector-specific regulations for aquaculture. This led to the government issuing its Environmental Regulations for Aquaculture in 2001.

In 2003, the government created a new institution, the National Commission on Aquaculture, to help form and evaluate aquaculture programs. The commission aimed to double the value of salmon exports within 10 years (from US\$1.2 billion in 2004 to US\$2.4 billion by 2014).

Throughout this period, the government designed regulations to facilitate the rapid growth of salmon farming in Chile and introduced environmental legislation only when pressed (for example, when requested by trade partners). Furthermore, the introduction of new regulations was not matched with enforcement mechanisms. Through its pro-growth and pro-export policies, the Chilean government allocated minimal time and funding to auditing the salmon farm industry, concerned that control via regulation might slow the industry's expansion.

Achieving Sustainability in the Chilean Salmon Farming Industry: Post-2007 Reforms

By 2007, Chile accounted for about one third of the world's farmed salmon production, second only to Norway in terms of output. However, the industry's rapid growth came at great environmental cost. In the early 2000s, salmon farms strived to boost production levels and profit margins, with little regard for long-term sustainability. Weak government oversight provided a further incentive for firms to take shortcuts and operate at higher capacities than ever before. These conditions set the stage for a disease outbreak that crippled Chile's salmon farming industry in 2007.

Following the crisis, the Chilean government and the private sector had to adapt their approach to ensure the sustainability of salmon farming as a key contributor to Chile's economy. The new focus on environmental sustainability meant that Chile had to address several new delivery challenges.

Stakeholder engagement. The rapid growth of the salmon farming industry had led to a "tragedy of the commons." There was little coordination between actors, and the drive to produce as much as possible as fast as possible had led to environmental degradation. After the 2007 crisis, government agencies and private companies came together to form the "Salmon Roundtable" to address coordination issues.

Lack of environmental regulation. The crisis made clear that existing regulations were insufficient to ensure that the salmon farming industry grew in a sustainable manner. Through roundtable negotiations, the government created new legislation for the salmon industry, including the establishment of "barrios," or neighborhoods, to encourage collective action to protect environmental resources within specified geographic areas. The government also passed a new aquaculture law, which granted more authority to the government to ensure the sustainable management of aquaculture.

Reporting and supervision. The government introduced a "risk scoring assessment" to identify environmental risks based on data reported by salmon farms. The government also introduced a strengthened enforcement mechanism to penalize farms that failed to comply with environmental regulations.

The new institutions created after the 2007 crisis rebalanced the relative bargaining power of public sector regulatory agencies vis-à-vis salmon farming companies. As a result, a new public-private dialogue has emerged in

the industry, and private companies, for the first time, have had to comply with government regulations designed to protect common-pool resources.

Lessons Learned

- Sustained cooperation between government agencies and private firms in Chile and Japan was critical to the Chilean salmon industry's growth. Both countries had aligned interests in developing the salmon farming industry in Chile: Japan gained a new source for the salmon its citizens demanded, and Chile gained economic growth in an underserved region. Both countries had important roles to play: Japan provided project funding and expert insight into the global salmon market, while Chile provided labor and clean water sources.
- Early public investment in new industries is often critical to their future growth. Private actors were initially unwilling to meet the high investment costs necessary to establish salmon farms in Chile. Fundación Chile and the Japan-Chile Salmon Project had to make the first move by introducing and developing new technologies and proving that salmon farming was commercially viable in Chile. After the new technologies were introduced, the cost of entering the market was lower, and private firms had a proven model to follow.
- While letting the industry “self-regulate” may have helped Chile boost production in a short space of time, there were huge negative consequences for neglecting to oversee the salmon farming industry. The land and water used for salmon farming was a natural resource, and the lack of effective regulations and enforcement concerning the use of this resource led to a “tragedy of the commons.” If the government had conducted sufficient scientific research into the long-term impact of salmon farming, it might have been able to foresee the 2007 crisis and put mechanisms in place to ensure that firms met sufficient environmental and sanitary standards.

Bibliography

Hosono, Akio, Michiko Iizuka, and Jorge Katz. 2016. *Chile's Salmon Industry: Policy Challenges in Managing Public Goods*. New York: Springer.

Inter-American Development Bank (IADB). 2016. *A Virtuous Cycle of Integration: The Past, Present, and Future of Japan-Latin America and the Caribbean Relations*. IADB.

Mendez, Ricardo Z., and Clara O. Munita. 1989. *La Salmonicultura en Chile*. Fundación Chile.

Sakurai, Teiji. 1995. *Chile Koku Santiago Chuzai no Ki [Record of activities in Santiago, Chile]*. Japan External Trade Organization (JETRO).



© 2019 International Bank for Reconstruction and Development / The World Bank. Some rights reserved. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. This work is subject to a CC BY 3.0 IGO license (<https://creativecommons.org/licenses/by/3.0/igo>).