

Chilean salmon is a common sight on the supermarket shelves of Japan.



## Chile's Road to Becoming a Top Salmon Exporter

Until a few decades ago, not a single salmon could be found in the South American country of Chile. Salmon originally lived only in the northern hemisphere. Today, though, Chile has become one of the world's top exporters of the fish—thanks in part to years of hard work by JICA specialists dispatched to the country.

### STARTING FROM SCRATCH

In southern Chile, with its extensive coastline and lack of arable land, a large part of the population consisted of poor fisherfolk. To improve their living conditions, the government of Chile aspired to harness the local geography and climate to develop a salmon farming industry. But every attempt to transplant salmon since the beginning of the twentieth century had ended in failure.

A turning point came in 1969, when technicians from the Chilean Fisheries Service underwent training in Hokkaido. This led to the start of field studies in two southern Chilean states in 1971. The following year JICA dispatched specialists to Chile and delivered masou salmon eggs from Hokkaido by air. The first fry were released in Chilean rivers in 1973, but none came back to spawn as adult fish.

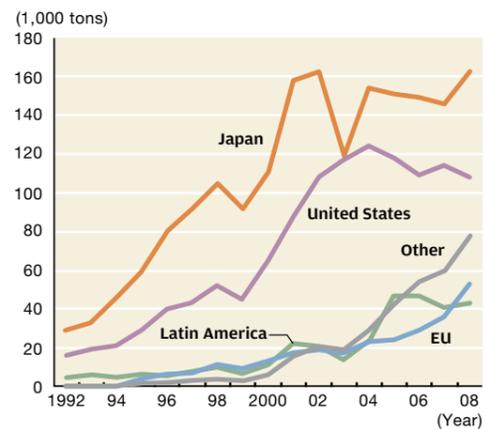
### CHILEAN-JAPANESE TEAMWORK SPAWNS SUCCESS

The Japanese specialists did not give up easily. They introduced chum salmon and pink salmon and switched from stocking to marine aquaculture. They also decided to cultivate salmon eggs locally instead of importing them from Japan.

Mitsuo Sakai of the National Research Institute of Far Seas Fisheries, Fisheries Research Agency, stayed in Chile as a JICA specialist for three years from 1986. "We were working our heads off with Chilean technicians at the time," he recalls. At last, in 1986, seven chum salmon swam upstream from Ultima Esperanza Bay. The efforts of the local staff and JICA specialists had finally paid off.

From 1987 onward, the focus of assistance

### Chilean Salmon Exports by Country



The first release of masou salmon fry in 1973.



A masou salmon that returned to spawn in 1989.

shifted from transplantation of salmon to full-fledged aquaculture. As Chilean salmon farming moved from the experimental phase to a viable industry, Japan moved to transfer the technologies needed for aquaculture, including systems for fish disease control and the development of high-quality formula feed.

Masou salmon, too, made a mass return in 1989. Local private enterprises joined the bandwagon one after another, and, by the conclusion of JICA's assistance, Chile boasted a robust salmon industry—and Japan had become the largest importer of Chilean salmon. The JICA assistance program ran its full course and produced a successful outcome. And to this day, the Chilean technicians who had engaged in the project continue to contribute their skills to the further development of aquaculture technology in their country.

## An Expanded Canal for a More Connected World

The Suez Canal, linking the Mediterranean and Red Seas, is a major commercial artery of global maritime transport, with annual passage of 15,000 ships. However, half a century ago, it was a shallow channel not capable of handling this vital flow of trade. A project to deepen and widen the canal for modern shipping was technically challenging and interrupted by war. But it did get done, thanks in part to Japan's technological prowess and Official Development Assistance.

### THE NEED FOR A DEEPER WATERWAY

The Suez Canal was opened in 1869. When the Egyptian government nationalized the canal in 1956, it was facing the problem of increasing vessel size. The canal was less than 10 meters deep at the time, which was not deep enough for large ships; therefore, it seriously needed an expansion.

Egypt thus launched the Suez Canal Expansion Project as a state undertaking. The plan was to dredge the canal floor to a depth of 15 meters and widen the channel to allow larger cargo ships and tankers to pass through. Out of many construction companies from across the world, Japan's Penta-Ocean Construction Co., Ltd. won the contract.

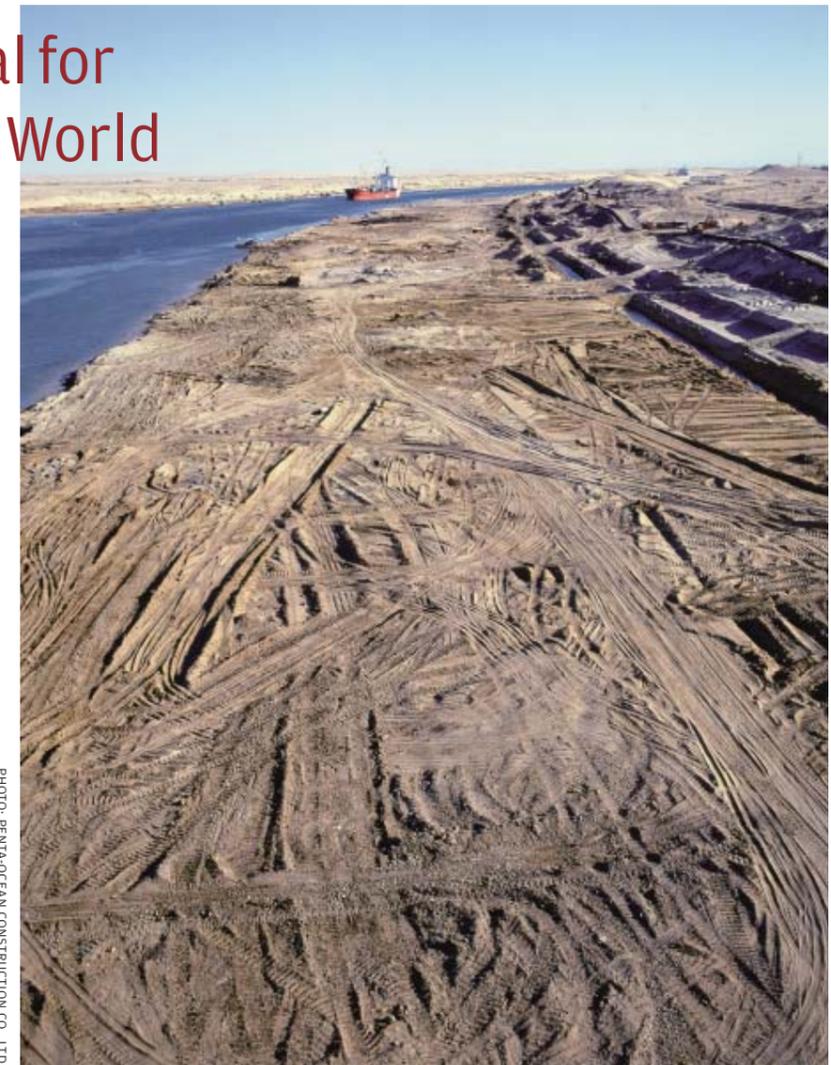
### NATURAL AND INTERNATIONAL CHALLENGES TO OVERCOME

In 1960, soon after construction began, the workers hit upon "diabolical" bedrock five times as hard as concrete. The rock was so hard that it broke the cutter blades attached to the pump dredging vessel, which was newly built to dredge the sediment lining the canal floor.

The Japanese engineers made every effort to overcome this obstacle. After rigorous analyses to find the perfect blade size and angle to withstand



Workers replacing a 3 m diameter cutter blade, which attaches to the end of the ship's rudder.



the rock's hardness, they finally completed a modified cutter tip. The uncompromising technological excellence of the team won worldwide respect for Penta-Ocean and for Japanese engineering as a whole.

Work proceeded after that until 1967, when the Six-Day War put a halt to the project. The Egyptian government closed down the canal to prevent invasion by the Israeli army. It was not until seven years after the war that construction finally resumed.

Over the course of the project Japan provided yen loans of ¥61 billion to begin with, and an additional ¥12 billion to purchase a new dredging vessel. Thanks to the hard work of local crews and Japanese engineers and effective use of JICA's financial assistance, the expansion of the Suez Canal was completed in February 1980, two decades after the start of construction. The Penta-Ocean employees who took part in the project say unanimously that although the project was long, it was worth every bit of the time that they gave to it.

PHOTO: PENTA-OCEAN CONSTRUCTION CO., LTD.

PHOTO: PENTA-OCEAN CONSTRUCTION CO., LTD.