

Salmon Aquaculture in Chile

Production Growth and Socioeconomic Impacts

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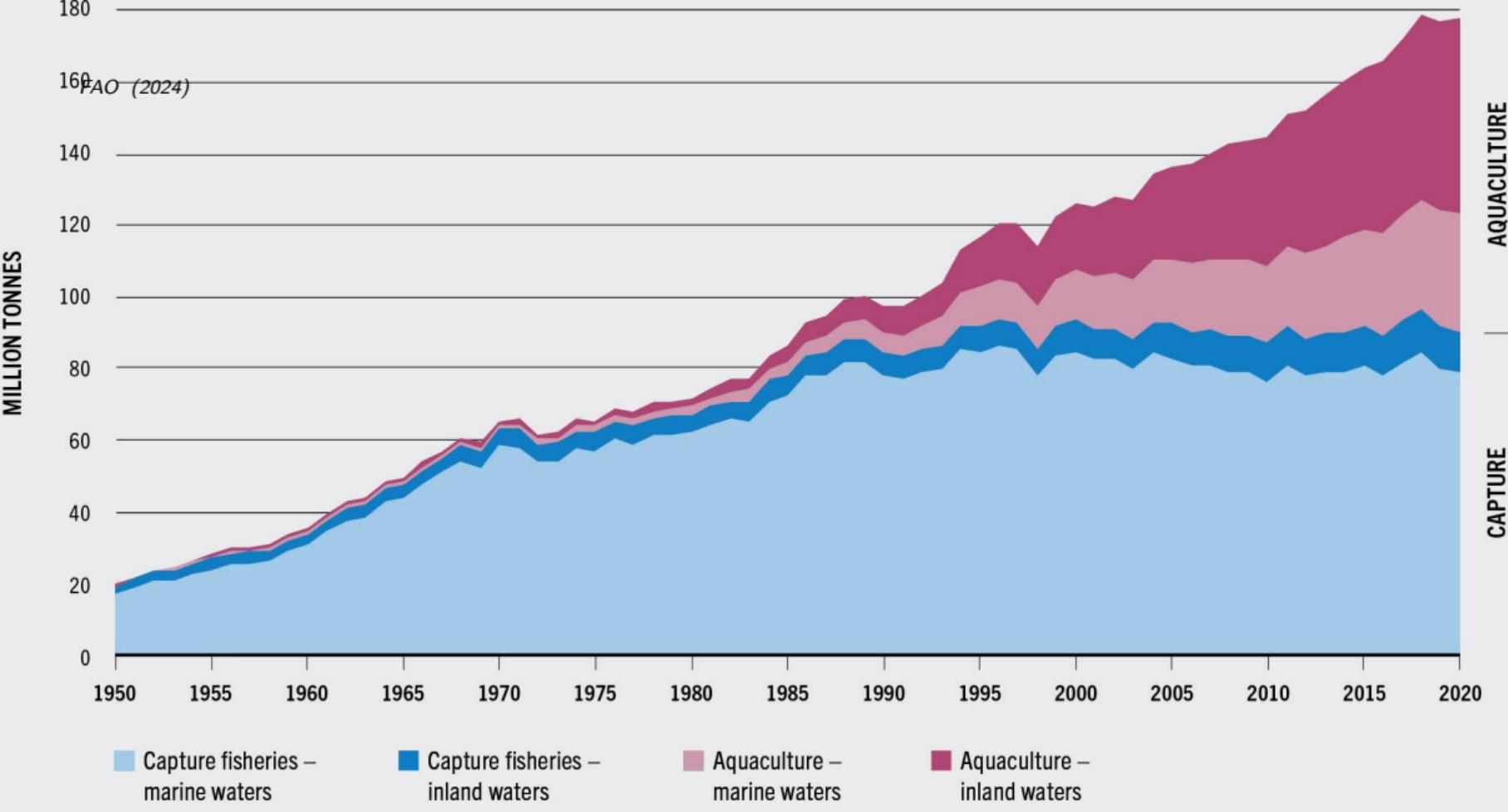
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Global Aquaculture Context

- Aquaculture is one of the fastest-growing food production sectors globally, driven by the rising demand for sustainable protein sources.
- Over the past decades, aquaculture has expanded rapidly, particularly in developing countries, which now account for over 90% of production (Garlock et al., 2020; Naylor et al., 2021).
- With its lower environmental footprint compared to other protein sources, aquaculture offers advantages for food security and resource efficiency (Gephart et al., 2021).

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- Chile is the world's second-largest producer of farmed salmon, supplying around 25% of the global salmon production.
- 1970s: Industry introduction through public-private partnership
- The industry has faced various environmental and economic challenges, yet remains a critical economic driver for Chile (FAO, 2023).

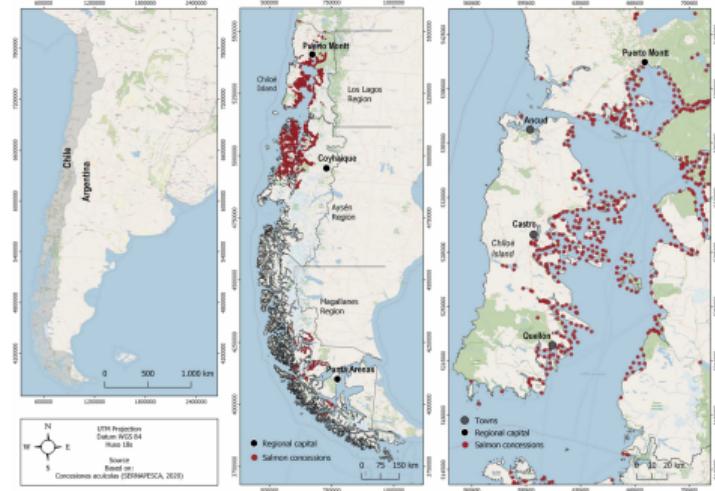


Figure: Chiloé Island and Chilean southern regions (Billi et al., 2022).

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Research Focus

- Objective: To provide a comprehensive review of the socio-economic impacts of the salmon industry in Chile.
- Key indicators include:
 - Employment trends and wage levels
 - Migration patterns
 - Broader social impacts like poverty reduction, income distribution, and female labor participation

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Chilean Salmon Production

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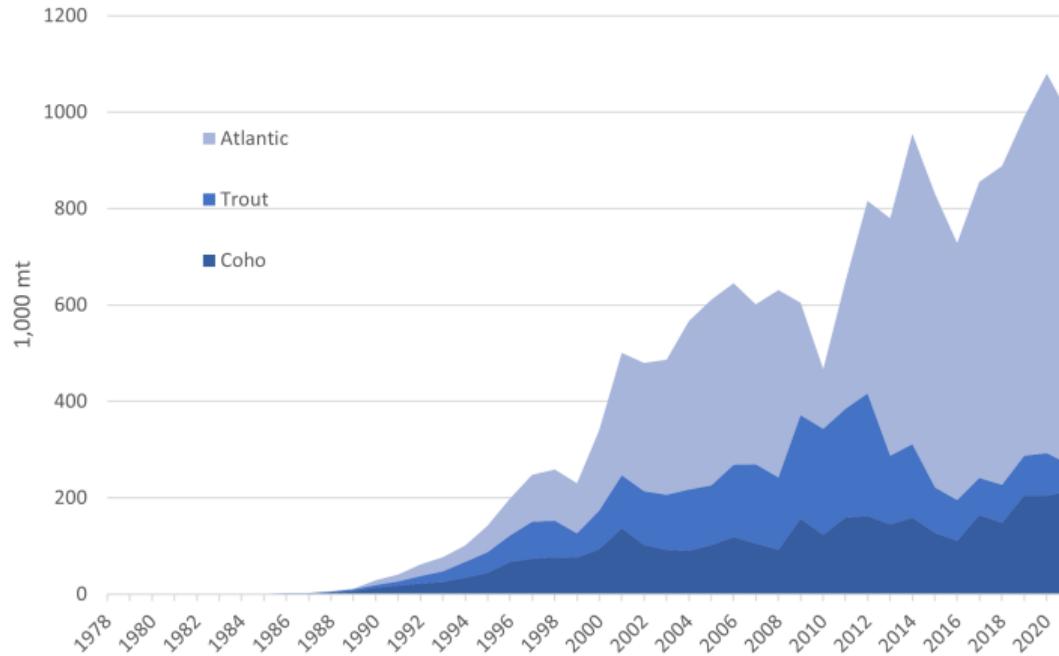


Figure: Chilean Salmon Production by Volume (1,000 mt)

The Salmon Industry in Chile's Exports

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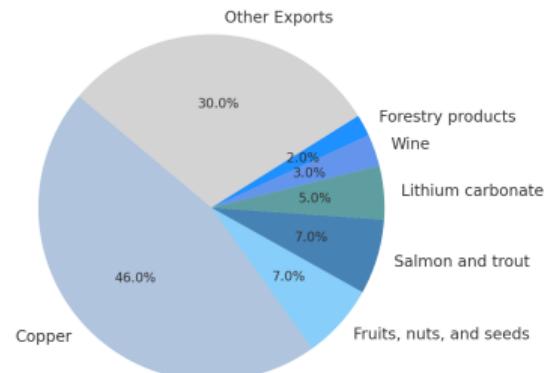
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- **Export Value:** As of 2023, salmon and trout account for **7% of Chile's total exports**, positioning them among the top export categories.
- **Regional Contributions:**
 - **Los Lagos Region:** 87% of the industry's exports
 - **Magallanes Region:** 10%
 - **Aysén Region:** 2%

Chile's Key Export Categories in 2023



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Direct Employment

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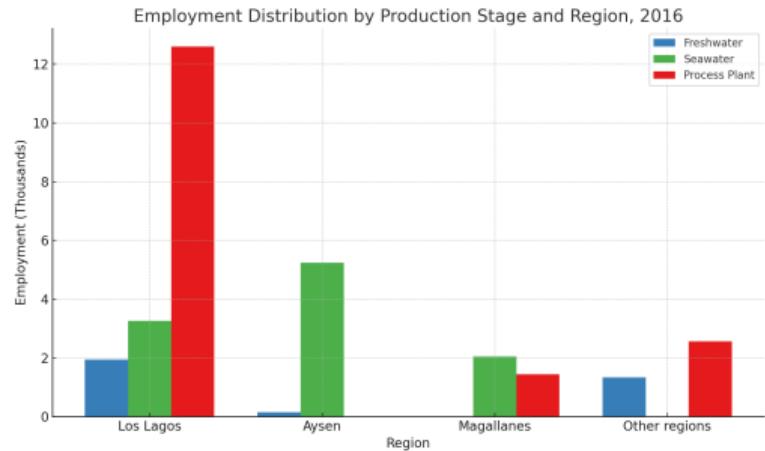
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- **Regional Distribution (2016):** The Los Lagos region leads in direct employment within the industry.



Direct Employment

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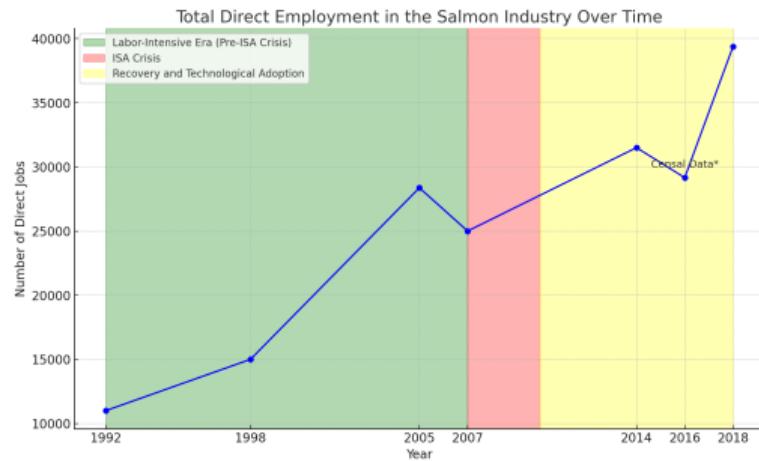
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- **Employment Growth:**
The salmon industry in Chile has shown a significant upward trend in direct employment over the years.

- **Environmental Crisis:**
The HAB event in early 2016, significantly impacted employment resulting in a temporary loss of approximately 1,075 jobs.



Salaries

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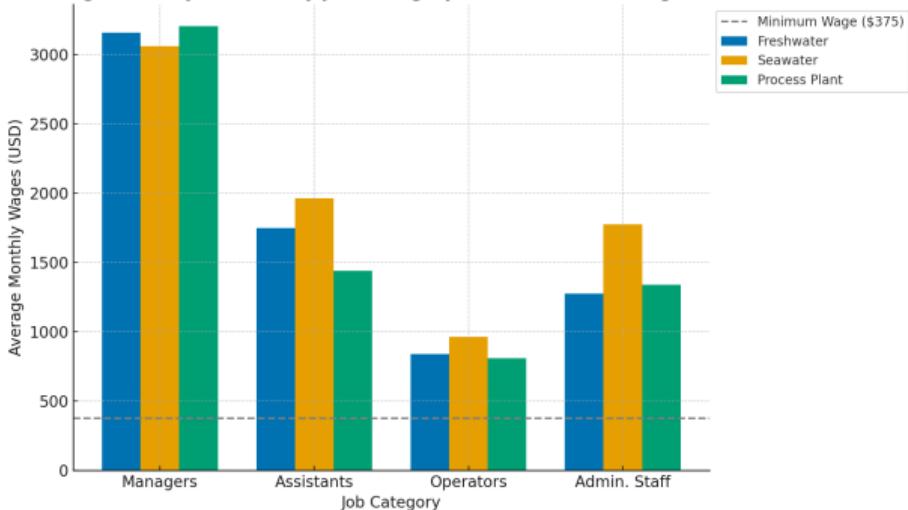
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- **Strong Wage Growth (2001-2016):** Salaries for lower-paid jobs more than doubled from 2001 to 2008; growth continued from 2008 to 2016 at 24.11
- **Higher Female Wages:** Women in the salmon industry earn more than the national and regional averages.

Average Monthly Salaries by Job Category and Production Stage (2016)



Migration

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Pre-Salmon Industry

Scarcity of employment in traditional sectors led to seasonal migrations.

2

Industry Growth

Stable income sources reduced need for seasonal labor migration.

3

Current Impact

37.8% of workers come from other regions, indicating net inward migration.

Poverty

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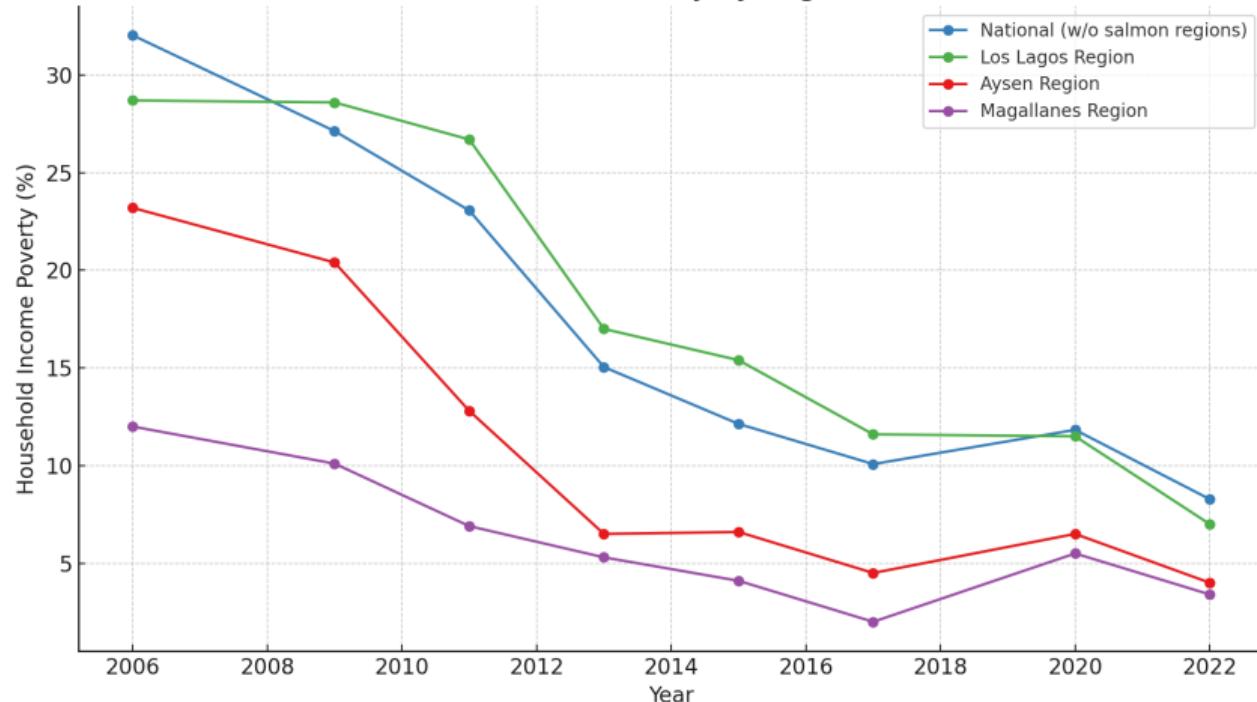
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Household Income Poverty by Region Over Time



Income Distribution

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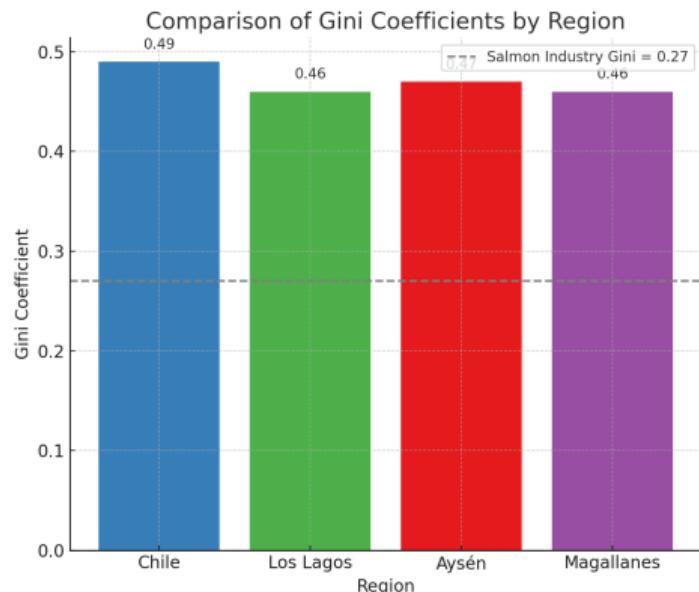
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- Salmon-producing regions exhibit slightly lower income inequality than the national level, potentially due to the salmon industry's equitable wage structure.
- The industry Gini of 0.27 shows relatively equitable remuneration across occupational roles, which may influence regional trends.



Female Participation

The salmon industry has provided opportunities for women to enter the labor force, especially in processing roles, challenging traditional gender roles and norms in rural-coastal communities.

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Trends in Female Workforce Participation (1996-2009)



Key Socio-Economic Findings of the Salmon Industry

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- Increased employment and sustained wage growth
- Migration reversal
- Macro-Economic contribution
- Poverty reduction and income equality
- Increased female participation

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ISA virus

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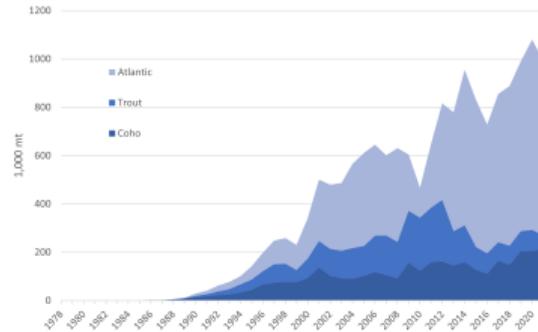
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HABs

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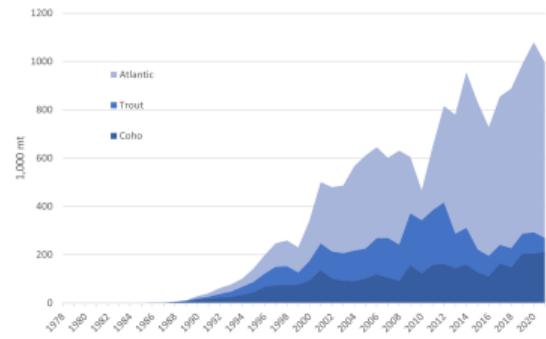
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Figure: Photo by Andrés Pérez.



Key Challenges and Crises in the Salmon Industry

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- Crises like the ISA outbreak (2007-2010) and HABS in 2016 have led to significant job losses, exposing the industry's vulnerability to environmental shocks.
- Regions with high production concentration face challenges in adapting, making them more vulnerable to economic disruptions and environmental events.
- Changing water temperatures, oxygen declines, and disease outbreaks-potentially intensified by climate change-pose ongoing risks to sustainable production.

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