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EVOLUTION AND PROSPECTS OF THE CHILEAN SALMON INDUSTRY

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FENACAM 2013

BACKGROUND

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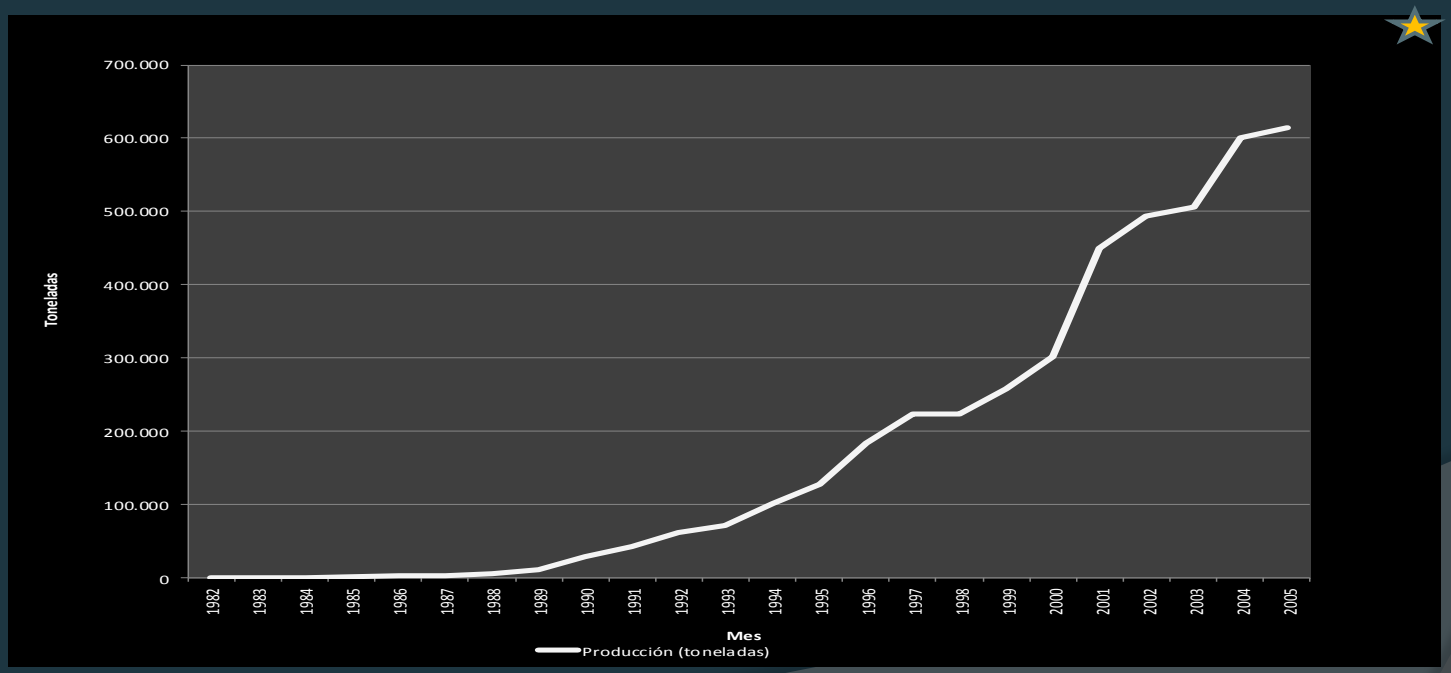
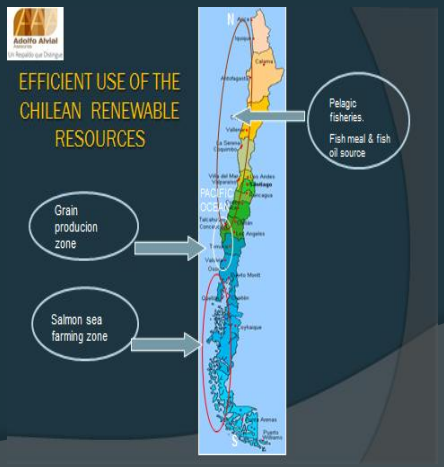
A SUCCESSFUL BRIEF HISTORY

Almost 25 years of an impressive growth based in favorable characteristics of the country.



WITH CRUCIAL FACTORS BEHIND THE FAST DEVELOPMENT

- A Good product with an increasing demand
- Good farming conditions
- Well qualified people
- Fast & efficient technology transfer process
- Pioneer spirit
- Efficient use of renewable resources



FROM SPOT COLLABORATION TO THE ASSOCIATION

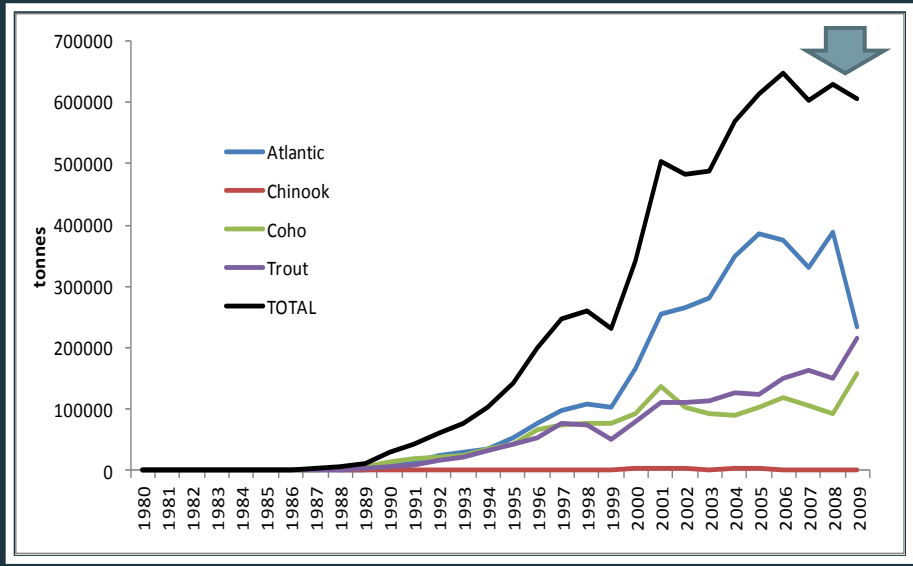
- Industry Quality standards,
- Phytoplankton Monitoring (1988),
- Defense of Dumping accusation (1997),

There were diverse areas of COMMON INTEREST…then, Association was a natural consequence of that.

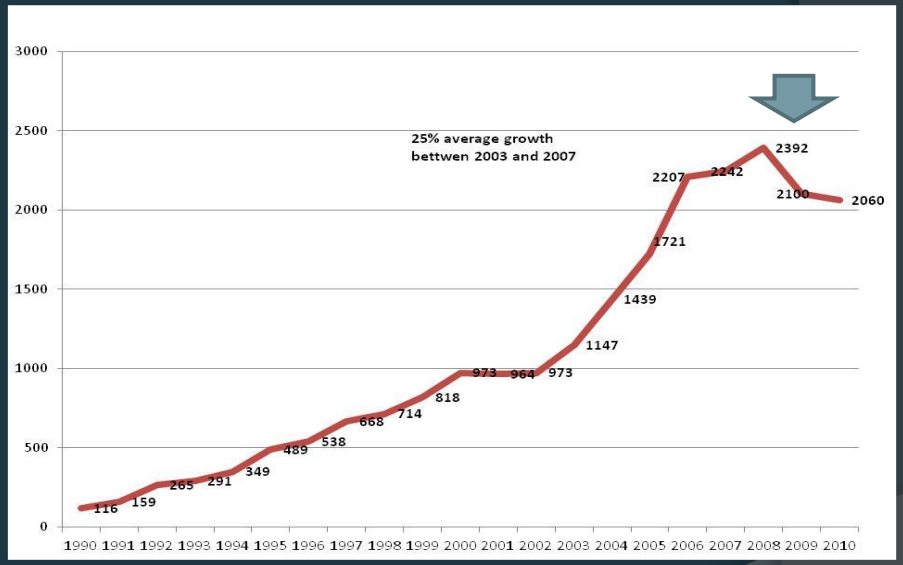
THE ASSOCIATION AND ITS TECHNOLOGICAL INSTITUTE BECAME A REALITY

IMPRESSIVE EVOLUTION OF PRODUCTION AND VALUE EXPORTS

VOLUME (TON)



VALUE (MILLION USD$ FOB)

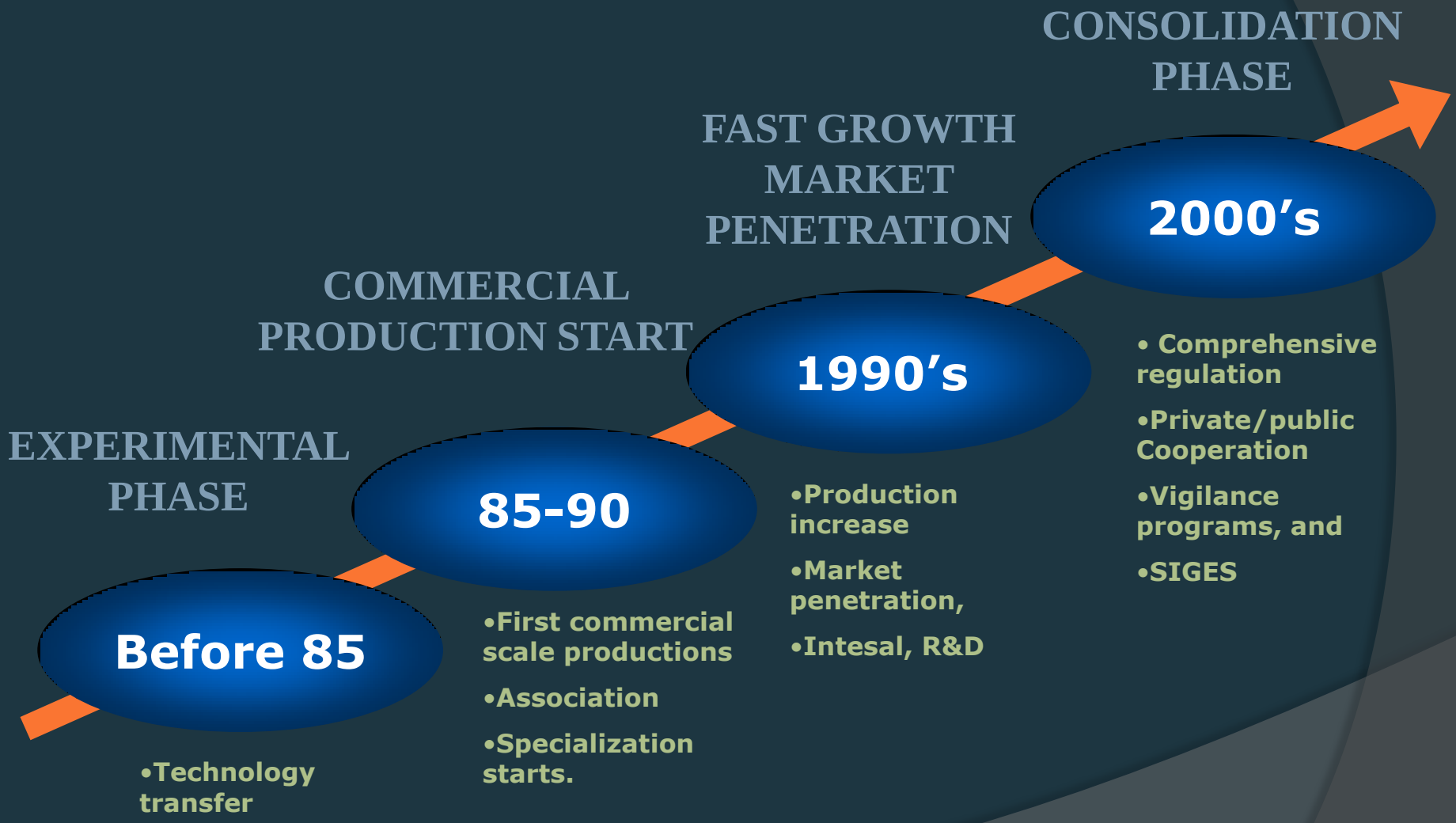


THE SALMON CLUSTER

- A 15 billion dollars industry (assets and stocks)

- 1200 supplier companies / social & economic development in Xth, XI and XII regions

A SUCCESFUL EVOLUTION



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ONE OF THE MOST DYNAMIC SECTORS IN CHILEAN ECONOMY

- It became the third economy sector after mining (copper) and Agribusiness (fruits, wines).
- Creating more than 25,000 direct and 20,000 indirect employment positions in 2 of the poorest country regions.
- Generating an industry cluster, avoiding import dependence and stimulating innovation.

…A NEW INDUSTRY, RETURNING 3 BILLION DOLLARS, EXPORTING TO MORE THAN 60 COUNTRIES.

…AND WITH BENEFICIAL REGIONAL IMPACTS

- Xth & XIth Southern regions used to be **among the poorest ones** in the country (80'S).
- In only 2 decades the Chilean salmon industry positioned them into the same category as Chile's **highest performing regions** (employment and per capita export).
- High emigration **was replaced by immigration** and the poorest segments declined as income per capita increased.

VARIATION PERIOD (2002 – 2003)	REGION REDUCTION	COUNTRY REDUCTION
Poverty	13-17 %	6%
Indigence	22-42 %	10%

THE ISA CRISIS

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HOWEVER THIS IMPRESSIVE PROCESS WAS INTERRUPTED

- …An environmental/sanitary crisis impacted the industry and community strongly. ISA V affected the principal salmon species (S.salar).

- The same industry that brought development and beneficial impacts it was behind a dramatic social crisis affecting Xth and XIth regions

WHAT WAS THE PROBLEM?

Insufficient knowledge of environmental and epidemiological factors limiting carrying capacity.

No integrated zone management plan nor biosecurity system

Limited comprehensive regulations and insufficient resources to enforce them

Taken from "The Chilean recovery of ISA crisis." GOAL 2011

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RISKS RAISED

Taken from "The Chilean recovery of ISA crisis." GOAL 2011

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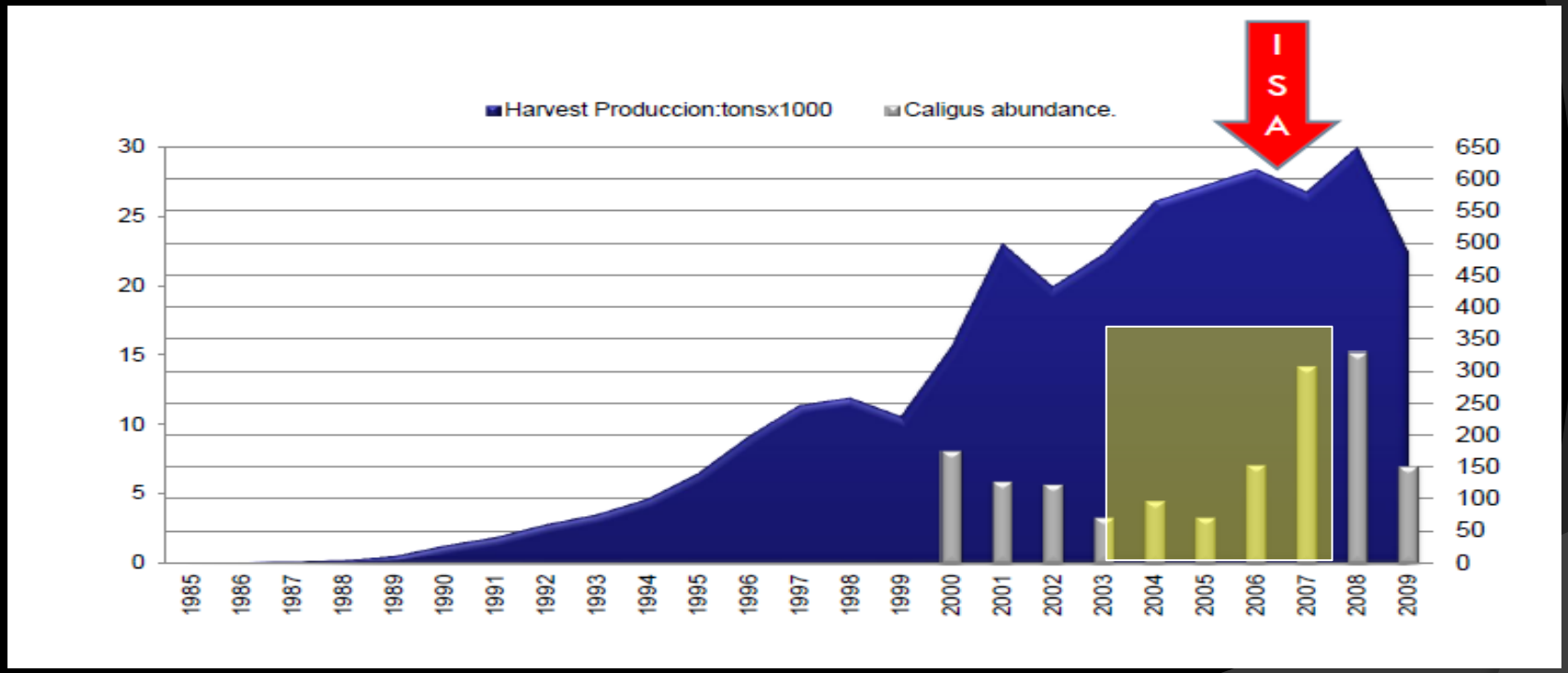
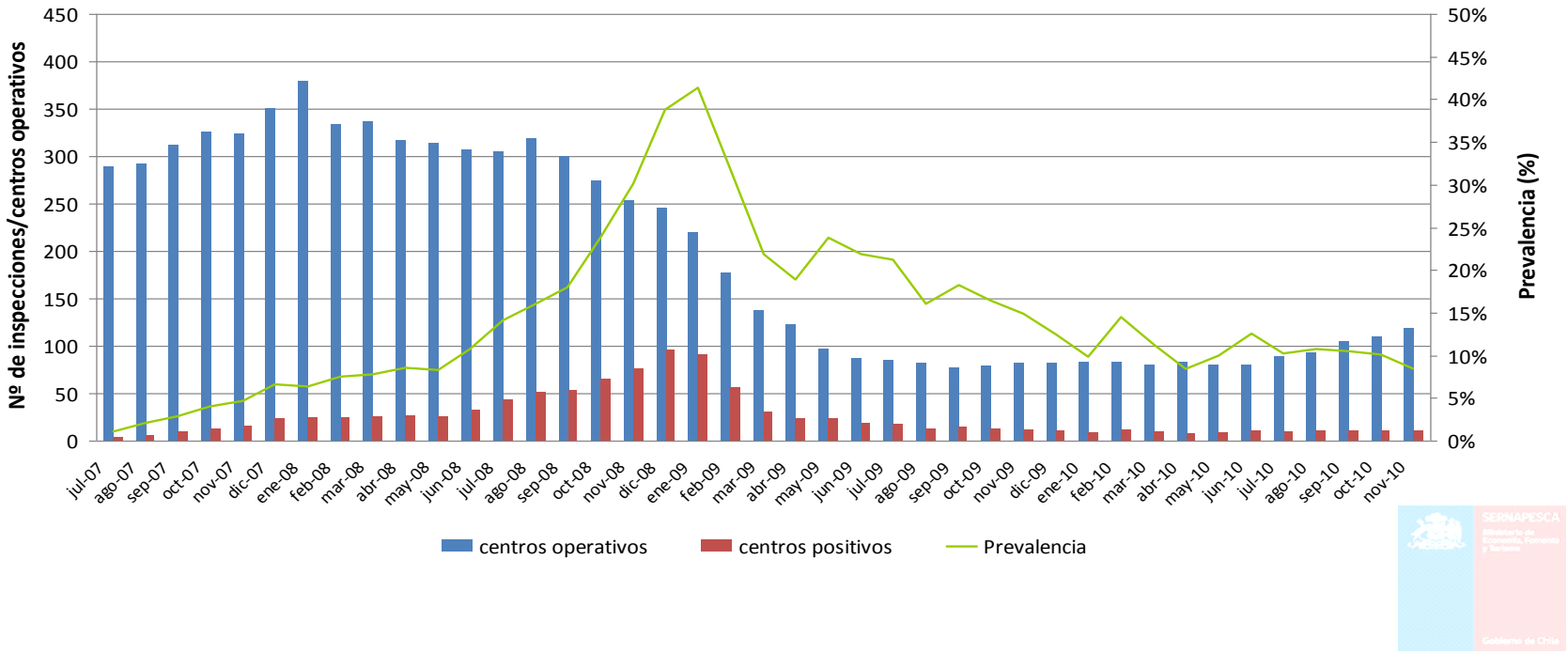
PRELIMINARY CONDITIONS

- ✓ ISA was introduced years before
- ✓ No outbreak until conditions worsened
- ✓ Caligus was a precursor



AND ISA TOOK THE OPPORTUNITY ATTACKING WEAKEND FISH

DISEASE PREVALENCE



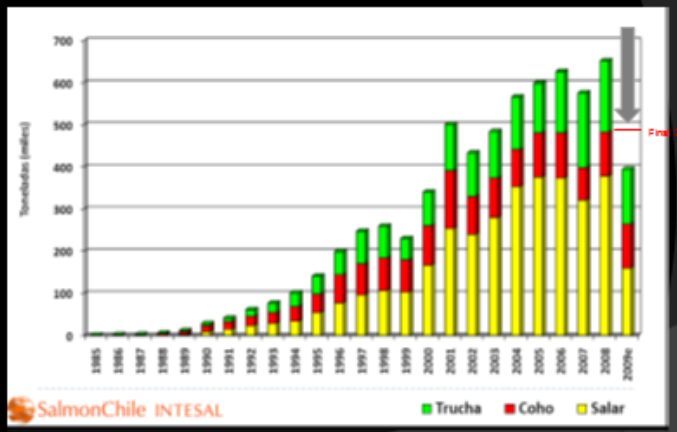
ISA inspections results: Positive farms (red bar), Operating farms (blue bar); Prevalence percentage (green line) in between July 2007 to November 2010.

IMMEDIATE IMPACTS

- Atlantic salmon, responsible of 2/3 of production was then affected,
  - rapid disease dissemination ,
  - high mortality rates
  - cage/farms culling,

- In 2009 there was a dramatic reduction in the biomass and smolt intake, consequently 2010 was the lowest harvest year.

WITH STRONG CONSEQUENCES



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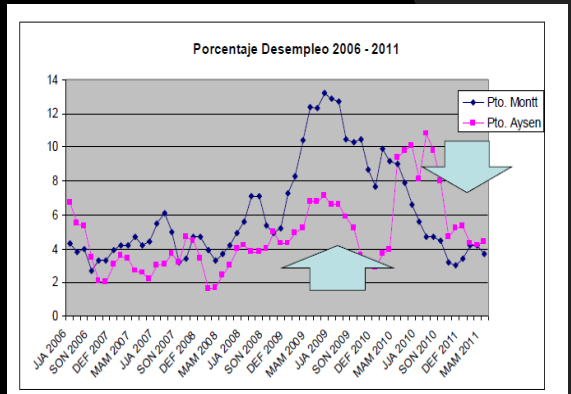
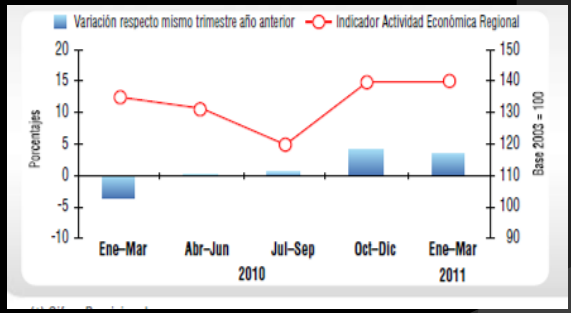
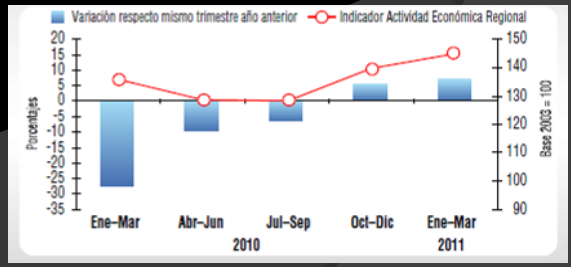
ECONOMIC AND SOCIAL IMPACTS

- Farm and Processing Plant closures
- Workers laid off (reduction of 50% app.) and high unemployment rate.
- Regional economic activity index decrease
- Reduced product quality and prices
- Loss of market shares, particularly in the USA and Europe.



Unemployment rate 2006 - 2011.





INDUSTRY TRANSFORMATION

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PUBLIC – PRIVATE STRATEGY DEFINITION

- Fast interaction of Producers, Key Suppliers and Regulators.
- Planning immediate and long term actions.
- Banks demanded cooperation for a third party financial review of industry.

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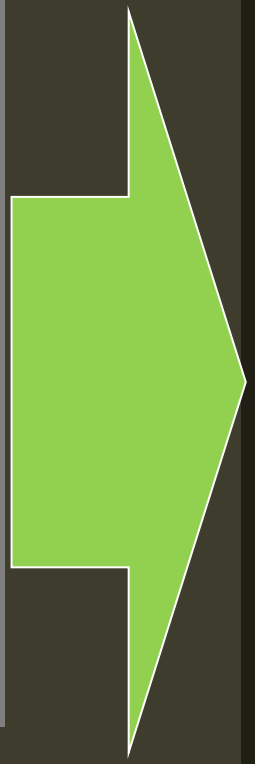
MEASURES TAKEN

Modify from "The Chilean recovery of ISA crisis." GOAL 2011

IMMEDIATE MEASURES TAKEN

- Public/Private Strategic and Technical Committees
- Voluntary Industry measures
- Government ISA and Caligus Plans



- ✓ Biomass culling in fresh water and sea water.
- ✓ Strong Monitoring effort
- ✓ Biosecurity measures thorough the value chain.
- ✓ Smolt Vaccination mandatory, health evaluation before stocking in SW
- ✓ No stocking of smolt produced in risky areas.
- ✓ No fish movements in SW.
- ✓ Lab. techniques improved and vaccines development based on Chilean isolates.

Modify from "The Chilean recovery of ISA crisis." GOAL 2011

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LONG TERM MEASURES

- Banks evaluation and debt renegotiation
- Permanent Public/Private committees

- ✓ Banks re-scheduled the companies debt & co found monitoring programs.
- ✓ New Law and Regulations with significant changes.
- ✓ New Aquaculture status in Governmental Agencies and more resources for research and monitoring

Modify from "The Chilean recovery of ISA crisis." GOAL 2011

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A NEW PRODUCTION MODEL WAS SETTLED

Strict sanitary control of eggs and eggs sources.

Broodstock kept in tanks on land or declared safe sea areas.

Hatcheries tend to modern water recirculation systems.

Fish have to vaccinated before entering into the sea.

Eggs and smolts have to be disease free.

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Fish health and environmental Monitoring programs.

Fish health is evaluated at least weekly

Chile produces all fish feed consumed in the industry in modern plants.

Remote Farms are supported with floating infrastructure with a remarkable development in Chile

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Detailed and controlled biosecurity measures in place.

Control and disinfection applied in principal logistic operations.

Fish stocked must remain in the same cage until harvest.

Sites in a Zone coordinate for stocking, harvest, fallowing and treatments.

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The harvest usually performed by specialized services, complying biosecurity measures

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An average process plant manages ISO, HACCP, Traceability, Quality & Management systems, plus specific requirements from clients and certifications. More automation

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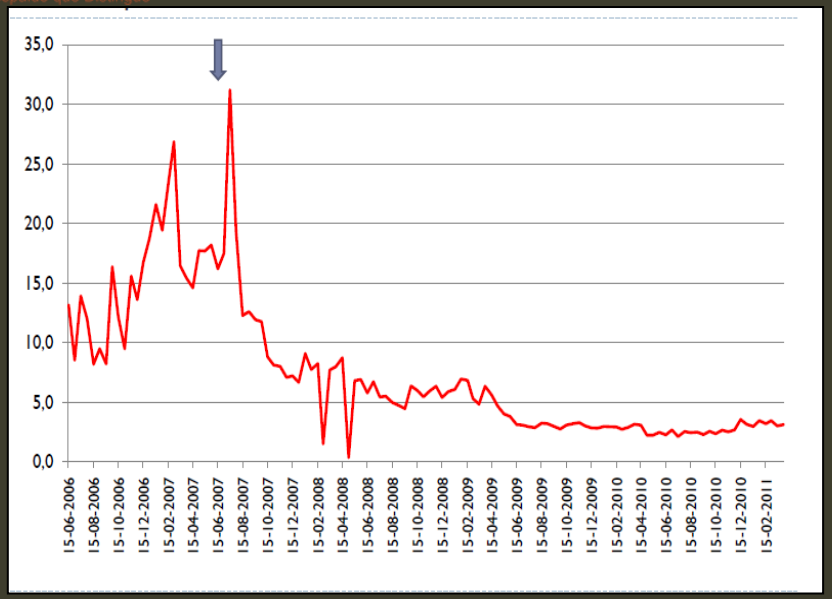
THE FAST EVIDENCE OF CHANGES

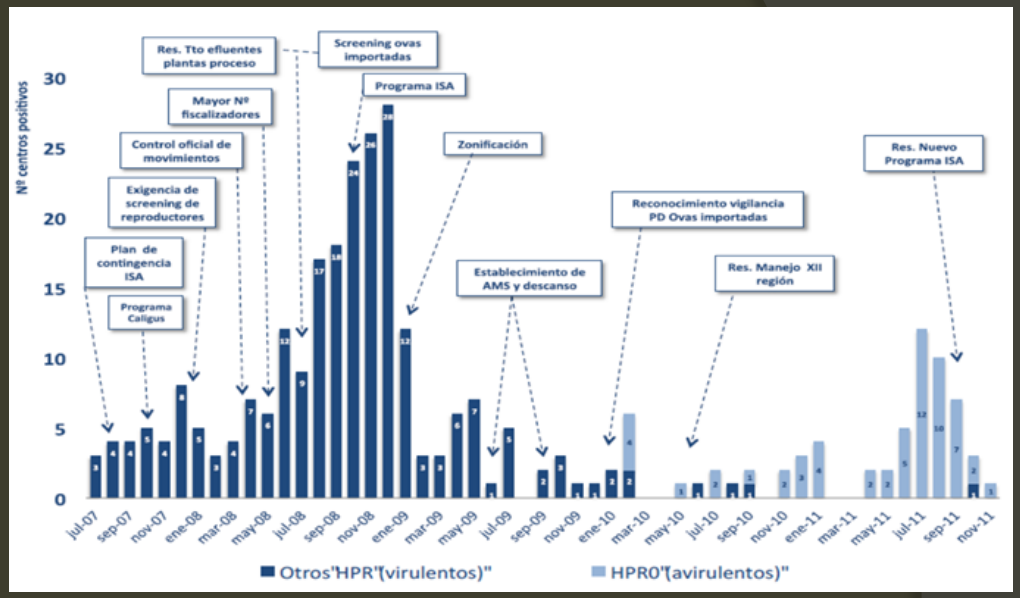
- Decrease in mortality
- Changes in fish performance indicators.
- Reactivation of smolt transfer
- More biomass in the sea water
- Harvest level exceeded 700.000 ton, in 2012, record in the history of the industry.
- Industry operating under tighter regulations.

FOUR YEARS AFTER THE CRISIS STARTED, THE INDUSTRY WAS BACK

SEA LICE / ISA CONTROL AND PRODUCTION PROSPECTS

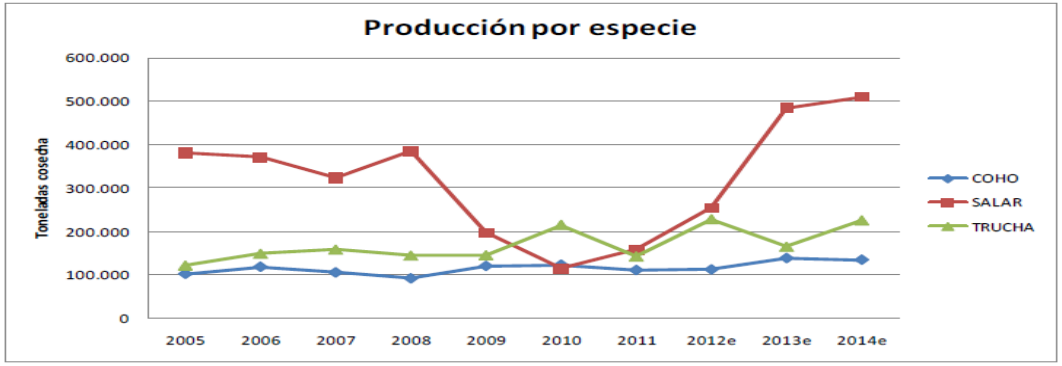


AVERAGE SEA LICE LOAD PER FISH



POSITIVE FARMS FOR VIRULENT (BLUE) AND NO VIRULENT STRAINS (LIGHT BLUE)

Proyecciones de cosecha



Pi(t)	2012e	2013e	2014e
COHO	112.229	137.694	134.029
SALAR	254.154	485.149	510.359
TRUCHA	228.157	164.703	225.520

HARVEST PROSPECTS PER SPECIES

SYSTEM IS WORKING

Only 1 positive case in 2011, zero in 2012, 3 cases in 2013, all of them controlled and confined with no dissemination.

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SOUTHERN REGIONS SHOW GROWTH AGAIN

- ✓ The southern regions again leading unemployment in Chile.
- ✓ Active governmental investment program to improve port facilities and roads.
- ✓ New tools to support investment in innovation
- ✓ Several former professionals and workers of companies created new supplier companies.
- ✓ New foreign suppliers: Research, Technology and Equipment.

Chile recovered its traditional markets and developed new ones (Brazil, China, South East Asia).

Almost all companies are presently certified at some level, principally: BAP or GlobalGap.

INDUSTRY PROSPECTS

CHILE´S POTENTIAL IN SALMON PRODUCTION

- ✓ Chile has recovered traditional markets and it has opened new ones responding to an increasing demand sustained by the growing middle class in emerging economies.
- ✓ Salmon can be farmed in the southern 2,000 Km of the Chilean territory, representing more than 40,000 Km of coast line that could sustain this activity.
- ✓ Even though only a fraction of that territory can be used for salmon production, is still an enormous potential for the industry.
- ✓ Waters are free of contaminants of concern in food safety terms, like persistent organic pollutants or industry origin heavy metals.

CHILE´S POTENTIAL IN SALMON PRODUCTION

- ✓ Chile has in its own territory all fundamental ingredients for feed that can be consolidated and traced as per market requirements.
- ✓ Chile has developed its own R&D and technology capacities, avoiding dependence of the foreign supply
- ✓ Changes in regulations and practices will allow Chile to live with ISAV and any other pathogen. Chile is now much better prepared to prevent and control diseases.

EVALUATION IN TERMS OF THE INDUSTRY SUSTAINABILITY

- ✓ Before the crisis, the industry had good market projections, high biological risk, weak research and regulation, and it was not sustainable in the medium term.

- ✓ After the crisis, the industry has shown some improvements in sustainability (social, economic, environmental and governance dimensions), but it is still pending the knowledge of carrying capacity in water bodies.

CONCLUSIONS AND LESSONS LEARNED

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- Technical and commercial success have to be accompanied by matching research, monitoring and regulatory efforts.

- A public - private coordinated effort, materialized in a strategic plan that considers immediate and long term actions, helps to prevent and face sanitary crisis.

- Zonation, Farm fallow periods, Biosecurity in value chain, environmental & epidemiological monitoring are essential tools to prevent sanitary crisis.

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- Strong regulation and enforcement systems must be established, based in local research and necessary resources should be provided to control due compliance.

- Involvement of the financial sector and portential investors is fundamental. Banks/Investors should know industry viability and regulations established to diminish risks.

- Market prospects are favorable considering the expected demand from middle class increase in emerging economies.

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- The industry in Chile has changed and it is moving towards sustainable development, but still it has to complete essential tasks: carrying capacity of water bodies, interaction with local communities and better public communication.

- The Industry can live with ISA V and other pathogens if research and monitoring programs generate knowledge /information to create and sustain regulations and practices that prevent disease outbreaks.

- Risk of introduction and dissemination of pathogens in the industry have been diminished.

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