**MEMORANDUM** ---------------------------------------------------------------------------------

To: Government of Chile

From: Independent Environmental Consultant, Seattle, WA

Subject: Implementing New Regulations in the Salmon Farming Industry, Chile

Date: 9th June 2004

1. **INTRODUCTION**

Over the years the salmon industry has grown at an incredible speed in Chile. With the growth comes a need to reevaluate environmental and social impacts of an industry that has had little to no regulation since it began 100 years ago. Pressure is mounting within Chile and internationally for new regulations to be implemented to not only protect the Chilean ecosystem, but also to boost the industry’s image and accountability in world markets. It is not only in the government’s interest to introduce new regulations, but also in the interest of local communities, foreign investors and consumers to introduce regulations that will maintain a sustainable salmon farming industry.

1. **SUGGESTED REGULATIONS**
* Designate a single independent advisory group to evaluate environmental costs of salmon farming industry in Chile, build on existing ecological reports and regulate commercial fishing and aquaculture in Chile.
* Implement new regulations to incorporate environmental costs into production costs, where companies will be charged for waste discharged into the ocean and depletion of natural resources.
* Implement regulations on use of antibiotics and other chemicals used in salmon farming.
* Introduce labor standard laws and regulations for working conditions in the factories.
* Mount a public awareness campaign with civil society groups to educate consumers and producers as to benefits of sustainable salmon production.
1. **BACKGROUND: THE SALMON INDUSTRY IN CHILE**

# *Salmon – a driving force in the Chilean Economy*

Introduced to Chile 100 year ago, salmon is now one of the most important exports in the Chilean economy and Chile's salmon industry is rapidly growing to become the largest exporter of farmed Salmon in the world. It is estimated that one in three salmon consumed next year will come from Chile[[1]](#footnote-2). Chile’s production of salmon jumped 20 times in the last 10 years to 35 percent of the world market share. Due to its ideal environmental conditions, Chile enjoys a comparative advantage in salmon production. Salmon reach market size six to twelve months earlier than in Norway, thereby reducing costs for Chilean salmon growers. Furthermore, Chilean farmers have ready access to large stocks of sardines and anchovies, which keep feed prices lower[[2]](#footnote-3), and have an ample supply of clean water sites.

# *Ecological Threats - New industry brought new hopes and new problems*

# When salmon farming was first introduced it was widely praised for its ability to bring consistency and lower prices to the salmon industry. It was believed that salmon farming would be able to produce more fish using fewer resources thus helping to feed more people for less money. Recent studies on the environmental impacts of salmon farming have shown that the industry harms the environment and modern aquaculture is in effect increasing the pressure on marine life. For each square meter of salmon floating cages, the environmental impact, in terms of consumption of resources and waste created, is equivalent to 10,000 square meters. The most significant of these are the organic waste and the food residue whose primary effect is the eutrophication of the water[[3]](#footnote-4).

Salmon are kept at higher density than battery hens, packed in cages of up to 70m in diameter, holding up to 500,000 fish. They are fattened on a diet of the remains of small wild fish, 8.8 pounds of which are needed to make 2.2 pounds of fish meal that is fed to salmon, to produce roughly 2.2 pounds of farmed salmon. Anti-bacterial chemicals used to ward off sea lice and other parasites, threaten both marine and human health. Diseases, such as sea lice, are being spread to wild salmon and "genetic pollution" is now occurring where escaped farmed salmon have breed with wild species. Coloring agents, used to alter the uninviting gray of the flesh of a farmed salmon, pose serious health risks to humans.

# *Pressure is mounting to regulate environmental effects*

Environmental sustainability of the salmon industry is becoming a major concern in Chile. Current methods used to calculate national income accounts fail to treat natural resources as depletable economic capital[[4]](#footnote-5). A study conducted by Andres Gomez-Lobo (1990) estimated that the growth rate of Chile’s fishing sector adjusted for depreciation was negative 2.2 percent as opposed to the estimated 8.8 percent per year stated in the National Accounting System (in Chile, SCN).

Forty percent of salmon production in Chile is in the hands of foreign companies (predominantly from Japan, Spain, Norway, and the US)[[5]](#footnote-6). These companies are taking advantage of Chile’s cheap labor supply, low productions costs and natural resources to produce a product that is consumed on the world market. The water they use is a natural resource precious to the Chilean people but it is being polluted by foreign companies that do not pay the external costs that they are incurring on the environment through the waste which they discharge into the ecosystem.

It is the government of Chile’s responsibility to control the pollution of foreign investors and ensure that environmental effects are being accounted for. The long-term impact of the pollution and environmental degradation will not only permanently damage Chile’s ecosystem but will also dramatically restrict future salmon production. Environmental groups in Chile are calling on the government to acknowledge the contamination from intensive farming, including mountains of organic waste from food and feces, and to include the depletion of salmon stocks in the National Accounting System.

* ***Criticism mounts concerning working conditions salmon workers***

The salmon farming industry has come under criticism recently for the low wages and poor working conditions in the factories. The Salmon Worker’s Union reported that workers receive no disability pay, work in the factories for twelve hours and do not have access to child care. Workers complain of health hazards from working in sub-zero conditions without breaks and have not been allowed to join unions to protest working conditions[[6]](#footnote-7). Workers rights have not improved since the Pinochet government dismantled the power of organized labor, eliminating workers’ rights to bargain collectively and ensure basic rights. Pressure from local and international groups is mounting on the government to redress the inequities which have developed from rapid growth with wage repression[[7]](#footnote-8).

1. **LONG-TERM BENEFITS OF IMPLEMENTING REGULATIONS**
* ***The Salmon Industry***

Given the recent media attention and criticism of the salmon farming industry in Chile and abroad, consumers and importers are increasingly questioning the origin of salmon and the standards of the industry within each country. As one of the largest producers of salmon worldwide, with 98% of salmon production exported, Chilean producers are largely dependent on the world market. The European Union has recently proposed banning imports of farmed salmon, which would cost Chilean producers millions of dollars. If importers impose sanctions against Chilean production for environmental reasons, Chile needs to be able to fight back. In order to do so, Chilean producers will have to prove that their production methods are ecologically and socially responsible. The Industry therefore that an inherent interest in abide by environmental standards and adjusting production to account for environment costs.

* ***Sustainability of the Industry***

The sustainability of Chile’s salmon farming industry will depend on the Chilean government’s response to the pressures that are already being felt in the political arena calling for new regulations requiring companies to account for the environmental and social costs of production. Given the importance of the salmon industry on Chile’s economic growth, it is in the government’s interest to protect the industry against permanent environmental damage. The 10th region is now saturated and largely destroyed and environmental groups are afraid that the same degradation will happen in the 11th region unless environmental controls and regulations where new farms are introduced very rapidly. In order for salmon farming to remain sustainable, the government has no choice but to reevaluate the ecological threats being imposed on the coastal regions and implement the new regulations outlined above.

1. **POLITICAL ENVIRONMENT – finding support for reforms**

The political map of the government of Chile helps clarify the government’s capability to implement the suggested regulations in the salmon farming industry and the steps the government will need to take to ensure the regulations are implemented successfully. At present the government has support within the social sectors, the political arena and industry pressure groups. Political opposition pressure is low given the weakness of the opposition coalition, Alianza (APC).

Labor pressure groups, NGOs (in particular environmental organizations), local fishermen, factory workers and native populations in Chile do not currently support the government’s policies. However, as the arrows on the political map demonstrate, the government will be able to pull in this significant additional support if it implements the proposed regulations, which will enhance its capabilities of successfully implementing the regulations.

Whether or not the government is able to maintain the support which it currently enjoys from the political parties, social sectors and pressure groups will depend largely on the government’s ability to build strong relationships with stakeholders and involve different groups in the decision-making process.

* ***Divided External Influence – Strong Trade Relations Prevail***

Besides its association with Mercosur - a trade block comprising Argentina, Brazil, Paraguay and Uruguay, of which Chile is an associate member, - Chile has entered into a number of other Free Trade Areas, including with Canada, Mexico, South Korea, most major South American countries and with the United States[[8]](#footnote-9). Chile has maintained close trading relations with its external partners but their support for regulations in the salmon farming industry is divided. The government of Chile will receive support from worldwide producers of farmed salmon that have long argued that Chile needs to implement new regulations to its salmon farming industry. In particular, producers in the European Union and the US both feel threatened by the cheap imports of Chilean farmed salmon that do not meet environmental and social standards. As long as the Chilean government does not implement tariffs and controls on its salmon farming production, its relations with its trading partners will not be jeopardized through the implementation of regulations.

On the other hand, foreign investors and international salmon producers in Chile may initially be opposed to the regulations. Given the strong economic influence of international firms in the industry - 40 percent of salmon production in Chile is in the hands of foreign companies (predominantly from Japan, Spain, Norway)[[9]](#footnote-10) – the Chilean government will need to work with these companies to build understanding and to ensure compliance with regulations. Chile will continue to hold a considerable comparative advantage in the production of salmon worldwide due to the ideal conditions for salmon farming. Given this advantage, it is unlikely that international companies will pull their investments out of Chile. However, their investments are important to the security of the Chilean economy where exports now account for around a third of the country's GDP[[10]](#footnote-11). Through open communication and dialogue, the government may be able to halt the movement of the industrial sector to the right and into opposition of its policies.

* ***Local and International Environmental Groups Push for Regulations***

The Chilean government will be able to rely on significant ideological support from the international environmental community for the proposed regulations. Environmental organizations in Chile and worldwide have long called on the industry to implement regulations and take account of the ecological threats of the farming process. One of the leading non-governmental organizations in Chile is the Terram Foundation, which was founded in 1997. Terram is leading a detailed investigation program and wide public awareness campaign to inform Chilean and international consumers of the conditions under which farmed salmon are cultivated[[11]](#footnote-12). Given the wealth of information currently available on the environmental impact of the salmon farming industry, the government of Chile can work with environmental organizations to introduce proposed regulations and set a standard for salmon farming operations worldwide.

* ***New Coalition Strengthens Demands For Participation in the National Dialogue***

Parlamento del Mar (Parliament of the Sea) is a grassroots organization created by “Centro Ecoceanos”, CONAPACH (Confederation of Independent Fishermen), and some small and medium size travel agencies of southern Chile to fight for the protection of the rivers, lakes, and coastal waters of southern Chile. In August 2001, the coalition succeeded in forcing the Chilean Sub-secretary of Fisheries, Daniel Albarrán, to resign after accusations of corruption and illegal enrichment were presented to the General Comptroller of the Republic, accusing Albarran of participation in salmon farming industries and of granting of aquaculture concessions[[12]](#footnote-13). Today the Parlamento del Mar is demanding participation in decision-making of new regulations, an open public debate concerning salmon-farming concessions and access to information regarding government policies. The Parlamento del Mar is a population organization with a very public image and a growing membership base. It could potentially be an important ally in the government’s campaign to impose new regulations and must be consulted at all stages.

* ***Native populations and Local Fishermen are losing territory and livelihoods***

Native populations, which include huilliches and kawaskar, have been largely affected by the massive intrusion into their native territories by the salmon industry. Until recently their loss was not acknowledged and they had little influence on a national level. However, their participation in the “Parlamento Del Mar” has given weight to their demands. Likewise, CONAPACH (the National Confederation of Independent Fishermen) which has 42,000 members is gaining in importance on the national level and is demanding accountability by the government for the environmental degradation caused by the salmon farming industry. As can be seen from the political map of the government of Chile, both groups are inherently anti-system but could be pulled in to support the government if they feel policies are taking their needs into account. They are gaining in strength and cannot be ignored by the government as it moves on implementing new regulations.

* ***Social Sectors Demand Regulations, Will Support Government***

The salmon industry currently employs 25,000 people in the coastal 10th and 11th regions of Chile. The industry has provided a big economic boost to the region; however it has also disrupted local communities and put hundreds of local fishermen out of employment. Furthermore, complaints from workers and from the Salmon Worker’s Union of poor working conditions in the industry are rising. The population of the coastal regions affected by the ecological threats of the salmon industry will support the government’s implementation of regulations to protect the local environment. If local fishermen will be able to return to the water and workers in the factories are offered improved working conditions, they will provide important ideological support for the regulations. The Salmon Worker’s Union has the ability to mobilize the workers and the local communities and will be an important ally of the government’s as they implement the new regulations.

* ***Conditional Support From Producers and Salmon Exporters***

The government of President Lagos has maintained a strong emphasis on promoting exports and the growth of Chilean exports, which account for the ideological support which it receives from both the Association of Salmon and Trout Producers ([www.salmonchile.cl](http://www.salmonchile.cl)) and from the international and domestic salmon producers in Chile. However, the recent scandal and subsequent resignation of Chilean Sub-secretary of Fisheries, Daniel Albarrán[[13]](#footnote-14) demonstrated that there is a need for additional reforms and increased government accountability. Having enjoyed favorable concessions during the period of military rule in Chile, which enabled the salmon farming industry was able to grow at an exponential rate, Chilean “empresarios” still rely on favorable conditions for production and investment. New regulations forcing the industry to account for the depletion of natural resources and industrial pollution will increase production costs of salmon farmers, causing a potential shift to the right on the political map away from their position of ideological support for the government. Given the political and economic power of the salmon industry in Chile, the government must work actively to avoid a this shift in support.

* ***Support within Government Creates Favorable Setting for Implementation***

Given the Chilean public’s support for international environmental policies and treaties signed by President Lagos, the government is in a good position to continue to demonstrate its concern for the environment through the implementation of salmon farming regulations[[14]](#footnote-15). The Concertacion coalition government is currently enjoying core political support around the country. The opposition coalition, Alianza, has not been able to present a strong opposition because of the Independent Democratic Union’s (UDI) breaking off of relations with its partner, the leader of the National Renewal (RN). However, the government must be aware that new regulations may face opposition from the Ministry of Trade and other sections of the government concerned with promoting export-growth. For example, Senetor Antonio Horvath, will be unhappy to impose controls on “the industry that brought life to his dormant region.”[[15]](#footnote-16)

New regulations will incur administrative costs as well as a potential short-term decrease in export revenues. These costs will likely be born by existing government agencies including the CONAMA (the Chilean environmental authority), SEIA (the process for evaluating environmental impact) and in particular, ESSAL (the company responsible for sanitation services for the region).

1. **IMPLEMENTING REGULATIONS – MEASURES FOR SUCCESS**

The coalition government (“Concertacion”) led by President Lagos is in a unique position politically to take the steps necessary to implement the regulations. However, given the uncertainty of some of the government’s core support within the social sectors, the political arena and pressure groups, the Government of Chile will need to work closely with the external and internal sectors to secure the successful implementation of its policies and maintain a favorable political environment. Furthermore, an effective implementation strategy will enable the government to pull in the cooperation of groups that have been ideologically opposed to its policies.

In order to create a favorable political environment for the implementation of reforms, the following strategies are recommended:

1. create a single independent environmental advisory group to evaluate environmental costs of salmon farming industry with clear objectives, defined roles and responsibilities for all participants;
2. build strong collaborations with political, social and external stakeholders;
3. mobilize sufficient resources (financial and human) to implement the policy; and
4. avoid implementing complex regulations.
5. ***Independent Environmental Advisory Group***
* **Build on existing research*:*** the advisory group should build on the research already conducted in order to establish an accurate measure of environmental costs. One of the functions of the group will be to act as a coordinating body to synchronize all research activities and NGO participation.
* **Maintain Independence**: Given recent political scandals highlighting the harm done when politicians are personally involved in the industrial sector, thegovernment must ensure that the advisory group remains independent throughout its evaluation of the environmental impacts of the salmon farming industry and its monitoring of implementation of the regulations.
* **Government Support and Political Jurisdiction**: In order for the group to be effective and accurate, it must be strongly supposed by the Government, given political jurisdiction to question all relevant stakeholders in the salmon farming industry and given access to all documentation relevant to the industry. Strong leadership is needed by the government to support the group and within the group to establish legitimacy. The group should report directly to the President.
* **Transparency and Openness to Public**: Reports from the advisory group should be published monthly and open to the public. Active associations representing communities affected by the environmental degradation of the ecosystem will be given a voice at all stages of research.
* **Clear Objectives and Timelines**: In order for the group to be effective, it will need to establish clear objectives and deadlines for completion of studies and implementation of reforms.
1. ***Stakeholders Collaborations***
* ***The industrial sector***: Given the tradition of concessions and exemptions from policy enforcement, the government must build a strong collaboration with leading salmon farming companies if it is to succeed in implementing the proposed regulations. Government official will need to create bringing mechanisms to establish legitimacy for the regulations, including a policy dialogue workshop within the government and public-private forums*.* Through the creation of independent advisory group to evaluate environmental costs of the industry in Chile, the government will be able to avoid personal interests in salmon farming affecting the implementation of regulations.
* ***Internal ministries and agencies***: the government must work with the Ministries of Trade and Commerce to build understanding for reforms and a consensus amongst government officials. The government must build on existing government agencies to create legitimacy for regulations and the enforcement mechanisms.
* Current agencies will need to be reformed to ensure their efficacy at implementing new regulations. Each agency must be given a clear mandate and new responsibilities for enforcement of the new regulations.
* CONAMA (Chilean environmental authority) and SEIA (the process for evaluating environmental impact) must work closely with the new advisory group as it conducts its evaluation of the environmental costs of salmon farming in Chile.
* ESSAL will play an important role in putting in place a mechanism for measuring the level of water contamination in salmon farming areas for cleaning contaminated waste water and creating a system for charging companies for the environmental costs incurred in production.
* Sanctions must be put in place for internal ministries and agencies that do not carry out their roles effectively.
	+ ***Civil Society***: Civil society has a crucial role to play in the implementation of environmental regulations. Given the wealth of research that has been conducted by organizations within Chile and internationally, the government should:
		- Seek nominations for its independent advisory group from environmental groups with expertise in aquaculture and marine studies. The Parlamento del Mar, Terram Foundation and Ecocoanos, as leaders in the field, must be involved in the establishment of the advisory group.
		- Build on existing reports to conduct a thorough survey of the ecological threats and social impacts of the salmon farming industry.
		- Engage civil society organizations in regular open policy dialogues.
		- Engage civil society in the establishment of regulations and subsequently in monitoring of enforcement.
		- Build capacity of organizations working with the government and create formal partnerships with clear roles and responsibilities outlined.
		- Time and resources spent must be compensated.
		- ***Local communities*:** Many local communities are represented by associations that are already demanding an active involvement in the salmon farming discussion. For example, the Parlamento Del Mar represents native communities whose territories have been affected by the industry and, through CONAPACH (Confederation of Independent Fishermen), represents over 42,000 fishermen and women. Suggested steps to ensure participation of the local communities and create legitimacy for the advisory group include:
		- The creation of a forum for regular discussion with the affected groups.
		- Measures to ensure that community recommendations are taken into account.
		- Participation during the evaluation stage and the drawing up of new regulations in order to ensure that local communities feel adequately consulted and not just told about regulations after the fact.
		- Prompt communication of advisory group’s recommendations and decisions through a monthly pubic forum to update communities on developments and changes (once regulations have been agreed upon)
		- Public access to all documents and government decisions
		- A public awareness campaign to educate consumers as to benefit of environmental standards
1. ***Mobilizing sufficient resources (financial and human) to implement the policy***

The implementation of new regulations in the salmon farming industry will require political, financial, managerial and technical resources. Ensuring that sufficient resources have been mobilized is part of the challenge of successful implementation. The government will need to ensure that regulatory bodies, the advisory group and agencies that are involved in the implementation of regulations have adequate resources. A compensation structure should be put in place.

1. ***Avoid complex rules and regulations***

A complex regulation is harder to implement and is more likely to get caught up in negotiations and discussions. Once the environmental assessment has been completed, the advisory group must work to establish new measures for accounting of the external costs of salmon production. Once established, these costs will be incorporated into new regulations for producers, who will be given a pre-determined period to alter their processes immediately. Regulations controlling chemical use in salmon fishing must likewise remain clear and simple in order to ensure their effective implementation.

1. **CONCLUSION**

The future of the salmon farming industry in Chile depends on whether the government can protect the sustainability of the industry and respond to pressure from environmental groups, local communities and factory workers for new environmental and social regulations. The regulations proposed in this paper are designed to protect Chile’s threatened ecosystems from further environmental degradation and provide an important framework fighting for the protection of the coastal areas of Chile and the marine life therein. They will to provide the first step in the process of accurately measuring the external environmental costs of salmon farms, including accounting for the depletion of natural resources in the National Accounting System. Finally, they provide an agenda for the salmon farming industry to remain competitive internationally and accountable to environmental and social standards.

Successful implementation of the regulations proposed in this paper is important for Chile’s threatened ecosystem, for the local communities that live in the coastal areas, for local fishermen and for factory workers. Implementation is also an imperative for the sustainability of the Salmon farming industry, for the stability of Chile’s economy and for consumers of farmed salmon worldwide. For this reason, the measures taken to implement the regulations will be crucial and will determine whether or not the policies have the desired positive effects.

In conclusion, it is recommended that the Government of Chile pursue the following strategies for the successful implementation of the proposed new regulations:

1. create a single independent environmental advisory group to evaluate environmental costs of salmon farming industry with clear objectives, defined roles and responsibilities for all participants;
2. build strong collaborations with political, social and external stakeholders;
3. mobilize sufficient resources (financial and human) to implement the policy; and
4. avoid implementing complex regulations.

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|  | **Opposition Sectors** | **Support Sectors** | **Opposition Sectors** |
| **External Actors** | Local Fishermen: *overseas markets* | European Union |  |  | Foreign Salmon ProducersInternational InvestorsMercosur | International Environmental Organizations |  |
| **Sector Positon** | Anti-System | Legal Opposition | Ideological Support | Core Support | Ideological Support | Legal Opposition | Anti-System |
| **President Ricardo LAGOS Escobar** |
| Social Sectors | Local *Chilean* Fishermen Native population (Huilliches and Kawaskar)Factory Workers |   |  | “Salmon Chile” Industrial AssociationSalmon Exporters: Chilean & International Companies. Concertacion (coalition government) |  |  |  |
| **Political Parties** |  | Alianza (APC) – Opposition Coalition  |  | Chamber of CommerceMinistry of Trade |  | Legend:Estimated movement following implementation of regulations Movement contingent on implementation strategy**Political Influence** High Medium Low |  |
| **Pressure Groups** | Environmental Groups e.g. Terram, Parlamento del MarUnited Labor Center |  |  | Association of Salmon and Trout Producers UnionTrade Unionists |  |  |  |

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5. **Net Loss: The Storm over Salmon Fishing.** Bullfrog Films, 2003 Moving Images [↑](#footnote-ref-6)
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13. Chilean Sub-secretary of Fisheries, Daniel Albarrán, resigned after concerning accusations of corruption and illegal enrichment were presented to the General Comptroller of the Republic, accusing Albarran’s participation in salmon farming industries and granting of aquaculture concessions. [↑](#footnote-ref-14)
14. Chile has signed and ratified the United Nations Framework Convention on Climate Change as a non-Annex I country. Chile also is a signatory to the more recent Kyoto Protocol and is party to several other international environmental treaties, such as the Montreal Protocol and the Convention limiting the movement of hazardous wastes. (Energy Information Administration. July 2002. “**Chile: Environmental Issues**”, http://www.eia.doe.gov/cabs/chilenv.html) [↑](#footnote-ref-15)
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