



Global Salmon LCA

A LIFE CYCLE OF FOODS

This is the first in a series of eight factsheets presenting the findings of the first worldwide life-cycle assessment (LCA) of a single food product. Lead partners in the Global Salmon LCA are Dalhousie University, Ecotrust, and SIK – The Swedish Institute for Food and Biotechnology. We will disseminate these findings over the course of the next year, as research is completed.

We calculate the impacts of salmon fisheries and aquaculture operations, from resource extraction to processing and delivery; and we identify opportunities for improvement in social and environmental performance. Our findings offer fresh perspectives on the development of more sustainable food systems.

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Key Points

- ➔ Food provision accounts for a significant portion of global environmental impacts.
- ➔ The impacts of food production are highly variable. In this study, we assess variations in practices, production systems, and geographic locales with regard to salmon provision.
- ➔ The local ecosystem impacts of salmon harvest and production are increasingly well understood. This study contributes a greater understanding of social and global environmental impacts.

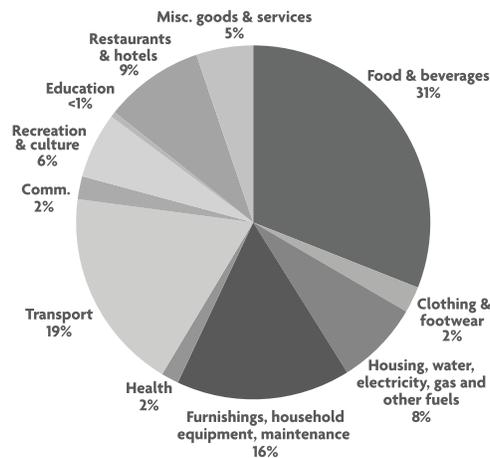
Background

Life-cycle assessment provides a systematic framework for calculating inputs and outputs at each stage of a product life cycle.

Understandings that have emerged from LCAs of food products include: (1) Food provision accounts for a significant percentage of global environmental impacts; and (2) The impacts of food production vary according to practices, production systems and geographies. For example, a study of different strawberry production methods in the United Kingdom found a six-fold variation in emissions of greenhouse gases. Similarly, studies of chicken farming in the UK have found a three-fold variation between production practices. In the Global Salmon LCA, we ensure a standardization of results by applying a formal LCA framework to an analysis of a single food product at a global scale.

We examine the salmon fillet as an example of an international super-commodity. It is one of the most widely consumed seafood products in the world, and the two modes of production – capture fisheries and aquaculture –

GLOBAL WARMING CONTRIBUTIONS BY AREA OF FINAL CONSUMPTION



In the European Union, the provision of food and beverages accounts for roughly 31 percent of life cycle contributions to global warming, according to a 2006 report by the European Commission Joint Research Center. The report finds similarly significant results for the contribution of food and beverage provision to acidification potential, human toxicity potential and other measures of environmental impact. (Source: European Commission Technical Report EUR 22284 EN.)

offer highly substitutable final products. We study three main production regions: the North-East Pacific (Alaska and British Columbia), the North-East Atlantic (Norway and Scotland), and Chile.

In addition to the global environmental impacts commonly examined in LCA research, such as global warming potential and energy use, we make progress on incorporating environmental concerns that are specific to salmon harvest and production at regional ecosystem scales, including habitat impacts and depression of wild salmon stocks. We also assess performance according to indicators of social welfare, such as fair wages and worker safety. These two areas of assessment represent methodological extensions to traditional LCA, and our work remains consistent with the LCA methodology standardized under ISO 14040-14043.

(continued)

While LCA studies to date have mainly considered global environmental impacts, efforts to promote sustainable seafood have mainly focused attention on local ecosystem impacts. The findings of this LCA study thus complement existing information provided by sustainable seafood campaigns. We offer an example of a multi-dimensional approach to seafood sustainability, considering local ecosystem, social welfare and global environmental factors, as applied to an icon of the global food marketplace.

MEASURES OF SUSTAINABILITY IN SEAFOOD CERTIFICATION, ECO-LABELING, AND CONSUMER EDUCATION CAMPAIGNS

	Local Ecosystem	Social Welfare	Global Environmental
Global Aquaculture Alliance	Limited	Limited	None
KRAV	Strong	None	Limited
Marine Stewardship Council (MSC)	Strong	Limited	None
Organic Agriculture Standards	Limited	Limited	None
Seafood Watch	Strong	None	None

Programs that seek to heighten consumer awareness of sustainable seafood choices have largely focused on the local ecosystem impacts of fisheries or aquaculture. As of April 2009, the largest global campaigns had not included global environmental impacts such as global warming or acidification potential in their consumer materials.

Opportunities for Action Influencers

Extend measures of seafood sustainability to include social and global environmental considerations.

For Further Reading

Garnett, T. 2008. Cooking up a Storm: Food, Greenhouse Gas Emissions and Our Changing Climate. Food Climate Research Network.

Pelletier, N. and P. Tyedmers. 2008. Life Cycle Considerations for Improving Sustainability Assessments in Seafood Awareness Campaigns. *Environmental Management*. 42(5): 918-931.

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Thrane, M., F. Ziegler and U. Sonesson. 2009. Eco-Labeling of Wild-Caught Seafood Products. *Journal of Cleaner Production*. 17: 416-423.

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About the Global Salmon LCA Project

The Global Salmon LCA project is the first worldwide life-cycle assessment of a single food product. LCA provides a systematic framework for calculating inputs and outputs at each stage of a product life cycle. Utilizing this framework, we examine the salmon fillet, icon of the global food system, and compare alternative methods of production and distribution. We evaluate global environmental impacts and expand on a traditional LCA to consider additional impacts specific to nearby ecosystems and social welfare. This analysis allows us to identify opportunities for improved performance in both aquaculture and capture fisheries — while building a more robust understanding of sustainable food systems. Please visit www.ecotrust.org/lca to sign up for updates.

Global Salmon LCA Factsheets

A Life Cycle of Foods

Salmon Ecosystems
 Capture Fisheries
 Aquaculture Production
 Closed-Containment Aquaculture
 Products and Transport
 Social Dimensions
 A Globalized Food System

ASTRID SCHOLZ
 Ecotrust
www.ecotrust.org



ULF SONESSON
 SIK - The Swedish Institute for Food and Biotechnology
engwww.sik.se



PETER TYEDMERS
 School for Resource and Environmental Studies,
 Dalhousie University
sres.management.dal.ca



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