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8th June 2012

Dear Mr. Annan,

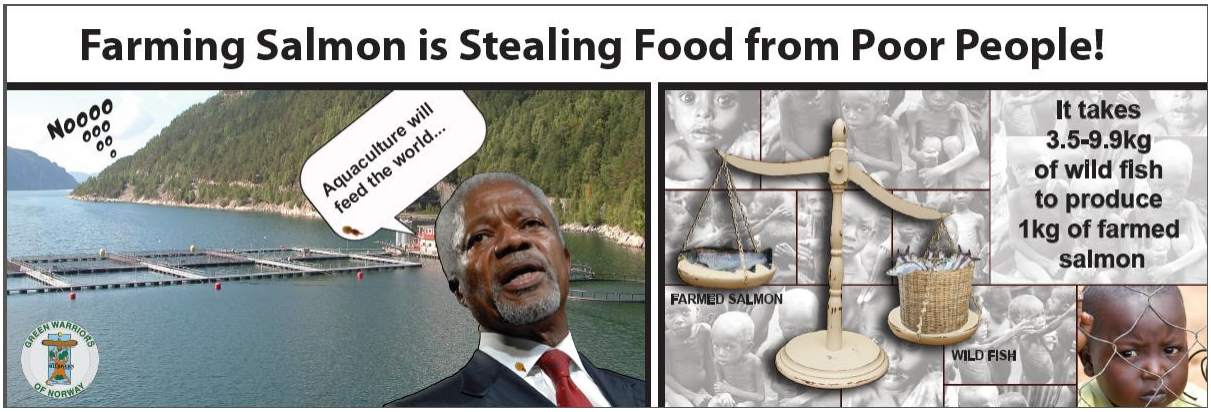
Farming Salmon is Stealing Food from Poor People & Our Oceans

In advance of your keynote presentation at the World Business Conference on Aquaculture (AquaVision 2012) in Stavanger next week (12th June), the Green Warriors of Norway would like welcome you to our beautiful country and request an audience during your visit.

Intrafish reported (6 June) that you have given instructions not to be photographed or interviewed by the press. However, we hope you find the time to meet to discuss serious concerns regarding the sustainability and social impacts of salmon aquaculture in particular.

We note that in your speech you are asking the question: "How can aquaculture contribute feeding 9 billion within 2050?"

We also ask you to answer this question: How can salmon aquaculture contribute to feeding 9 billion people when it is draining our oceans for feed and stealing food from poor people?



According to the Aquavision program: "With the global population expected to reach 9 billion by 2050, many questions about food security remain unanswered. To meet the future demand of seafood, the aquaculture industry needs a sustainable future growth plan."

The Green Warriors of Norway recognize that aquaculture has an important role to play in alleviating poverty and contributing to food security. However, the farming of carnivores such as salmon is not the answer. Salmon farming is not a panacea but is actually exacerbating the global food problem.

Far from feeding the world, salmon aquaculture is draining our oceans of wild fish. In simple terms, promoting salmon aquaculture as a solution to the world food crisis is socially irresponsible. Salmon farms steal precious protein from the mouths of hungry people in Africa and South America (more details are presented below).

Peer-reviewed scientific research has showed that salmon farms are impacting on wild salmon populations and human populations all around the world. In fact, concerns regarding salmon aquaculture's impact in Canada on indigenous food sovereignty and the right to food were tabled at the 11th session of the United Nations Permanent Assembly on Indigenous Peoples in New York last month.

A document presented by the International Human Rights Association of American Minorities stated:

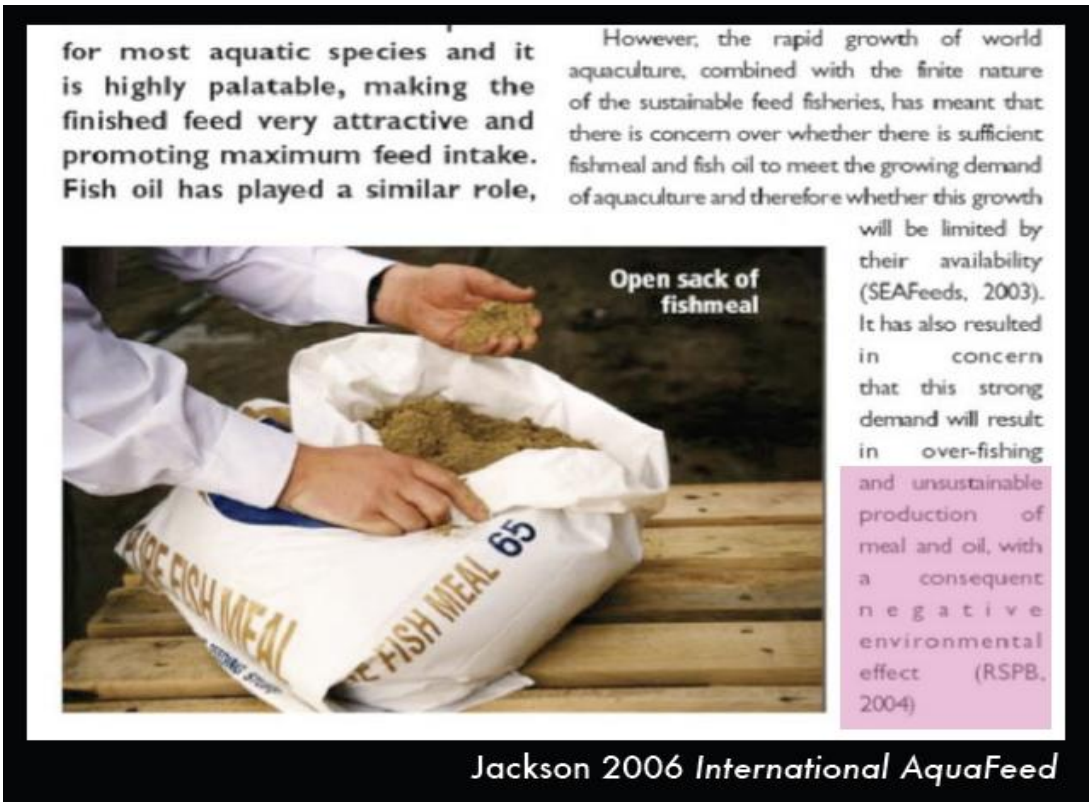
"Industrial Atlantic salmon feedlots have been in operation on the coast of British Columbia for two decades, despite serious protest from indigenous nations and no consultation on the matter from government with the vast majority of indigenous nations affected by them. The farms are disease vectors and they are situated directly in the wild Pacific salmon migration corridor of the Fraser watershed and that of many coastal systems in southern BC, where the farms are located.

These wild salmon have always been the lifeblood of the coastal and interior peoples. All five species of Fraser salmon have crashed to critical lows since the introduction of salmon farming in the Pacific northwest, and this is causing a crisis of loss in terms of food, cultural activity and associated indigenous language use, and community stability economically because of food shortage. Evidence of the culpability of salmon farming in this matter is ignored and even obscured by the federal department concerning Fisheries and Oceans, particularly in the case of evidence of the presence of a deadly salmon flu, Infectious Salmon Anemia virus, in the farms. Not only does the state deny the negative impact of these farms, it actively promotes their product in American and European markets. This year, in 2012, many locally farmed Atlantic salmon bought in British Columbia groceries tested positively for ISAv" (available in full online here).

"We need fish meals not fishmeal," said Dr. Patricia Majluf at the Seafood Summit in 2011. "Put simply – fish feed multinationals are stealing perfectly healthy food out of the mouths of Peruvians."

Read Dr. Patricia Majluf's presentation in full online here

As Dr. Jennifer Jacquet from the University of British Columbia said in her presentation: "If you're farming a predator you'll always get less out than you put in" (read more details via 'Fighting for Fish Meals Not Fishmeal').



"No problem, we are told," wrote Dr. Daniel Pauly from the University of British Columbia in 2009. "We are going to farm the fish we need. But there is a hitch: salmon and many other

farmed fish are carnivorous, and farming them involves feeding them with animal flesh, just as farming mountain lions would. In this case, the animal flesh, supplied in the form of pellets, consists of ground up sardines, anchovies, mackerels and other edible fish caught mainly - you guessed it - in developing countries. About 3-4 pounds of ground up small fishes are required to produce one pound of farmed salmon. Thus, the more farmed fish we produce, the less fish there is. This is akin to robbing Pedro to pay Paul."

A report published in 2011 by the Green Warriors of Norway calculated that it takes over 3 tonnes of wild fish to produce one tonne of Norwegian farmed salmon.

EMPTIES THE SEA OF WILD FISH

To produce 1 kilogram of farmed salmon, the aquaculture industry consumes between 2.5 and 5.5 kilograms of wild fish, and more than half of the raw material used in salmon feed is nutritious and fully suitable for human consumption. Industrial aquaculture of fish-eating fish is incredibly resource-demanding and empties the sea of wild fish. Wild fish which could have been eaten by humans or other animals forming part of the ecosystem. The harvesting of fish for use as fish feed also poses a threat to large populations of seabirds and wild fish.

Consumption exceeds production

1000 kilograms of wild fish become 228 kilograms of fish meal or 50-120 kilograms of fish oil. According to the feed producer Skretting AS, their salmon feed contains 15 per cent of fish oil and 31 per cent of fish meal (Skretting 2010.) **This means that Skretting in this case uses at least 3.5 kilograms of wild fish to produce 1 kilogram of salmon feed.** In 1995, the figure was 7.5 kilograms of wild fish per kilo of farmed salmon, in 2005 this figure decreased to 5.4 kilograms, and the current figure is around 3 kilograms (Olsen and Karlsen 2009: 140.) The figure will depend somewhat on the kind of wild fish used.

Our report also highlights how salmon aquaculture is spreading infectious diseases, using toxic chemicals and is impacting on wild fish via contaminated and uneaten feed. For more details read – 'Report on the Environmental Impact of Farming of North Atlantic Salmon Farming in Norway' - online here

Another report – 'Salmon Piranha Style: Feed Conversion Efficiency in the Chilean Salmon Farming Industry' – published by Terram in 2006 calculated that by 2013 the feed conversion efficiency of salmon farming in Chile would be nearly 10 to 1 (i.e. it takes 10 tonnes of wild fish to produce one tonne of Chilean farmed salmon).

Estimated FCE for the Chilean salmon farming industry (2013)

Item	Year 2013
Salmonid production (thousand tons. round)	1,283.00
Feed used (thousand tons.)	1,816.07
Feed/salmon conversion ratio (FCR)	1.42
Percentage of fishmeal in feed	35
Percentage of fish oil in feed	35
Total FM required for feed (thousand tons.)	635.62
Total FO required for feed (thousand tons.)	635.62
Pelagic resources needed to produce FM in feed (thousand tons.)	2,354.16
% Conversion fish/FM	0.26
% Conversion fish/FO	0.05
FO produced as sub-product of FM (thousand tons)	117.71
Additional FO needed (thousand tons)	517.92
Pelagic resources needed to produce additional FO in feed (thousand tons.)	10,358.32
Total pelagic resources needed (thousand tons.)	12,712.49
Total feed conversion efficiency	**9.9**

A 2007 report – "Sustainable Marine Aquaculture: Fulfilling The Promise; Managing The Risks" - graphically explained the drain on marine resources via aquaculture as follows (salmon farming was shown to have a 'Feed Conversion Efficiency' of 6.5):

Another report – 'Little Fish, Big Impact' – published in April 2012 recommended that catches of forage fish be cut in half due to concerns of overfishing and use in aquaculture. "Demand for forage fish in agriculture, aquaculture, and other industries will continue to increase pressure on wild forage fish stocks," said the report.

"Forage fish have been particularly important to the development of the aquaculture sector, which now supplies almost half of the total fish and shellfish for human consumption," continued the report. "In 2006, 88.5 percent of fish oil and 68.2 percent of fish meal produced globally were used by the aquaculture sector. Rapid growth in aquaculture production has resulted in greater demand, higher prices, and increased consumption of fish meal and fish oil by the aquaculture industry. Demand for carnivorous farmed fish in

industrialized and emerging nations will continue to be an important driver in the world market and will therefore continue to increase pressure on wild forage fish stocks."

Another study published in April 2012 "detected eight species of wild marine fish belonging to high trophic levels in the food chain in aquaculture feed." According to the study published in *Fisheries Research*, the resources that have been found are: Peruvian anchovy (*Engraulis ringens*), sprat (*Sprattus sprattus*), Pacific cod (*Gadus macrocephalus*), whiting (*Merlangius merlangus*), common herring (*Clupea harengus*), Pacific sandeel (*Ammodytes personatus*), horse mackerel (*Trachurus symmetricus*) and blue mackerel (*Scomber australasicus*).

Science Daily reported (25 April): "Aquaculture initially came as an ecological initiative to reduce pressure from fishing and to cover human food needs. However, a problem has emerged: consumers prefer carnivore species, like salmon and cod that require tons of high quality protein for their quick, optimum development."

"If these proteins are obtained from extractive fisheries, aquaculture stops being an alternative to over-fishing and starts contributing to it, turning it into a risk for natural marine ecosystems," said Alba Ardura, lead author of the study and researcher at the University of Oviedo said. "If species from extractive fishing are used to feed farm fish, aquaculture does not help minimise over-fishing" warns the expert who suggests "urgently" revising the composition of aquaculture feed to replace them with other proteins."

Scientists at the University of Liverpool in the UK are now developing a new plant-based product that could replace fishmeal, reducing the need for farmers to feed fish to other fish. Dr Iain Young explained in May 2012: "Using fishmeal means that you are feeding fish to fish. With the increasing demand for fish, in a human population that is set to reach just over nine billion in the next 20 years, this approach will continue to deplete fish stocks."

"For many high value cultured species the consumption of fishery resources (in terms of small pelagic forage fish equivalents) is greater than the quantity of cultured fish produced," reported a scientific paper published in Ambio in 2009. "The long term sustainability and ethics of using these precious fishery resources as feed inputs by the aquaculture sector has been questioned."

"According to the United Nations Development Program, the World Health Organization (WHO), and FAO it is estimated that about one-fifth of the world's population is currently living in extreme poverty (defines as living on less than USD 1 per day), with more than 4 thousand million people earning less than USD 4 per day and the majority living within developing countries," concluded the paper. "Moreover, with the world population expected to grow by 2.6 million between 2005 and 2050 (a number roughly equal to the total global population in 1950 of 2.5 thousand million), there are growing doubts as to the long term sustainability of many existing agricultural and aquacultural food production systems to meet the increasing global demand for food."

Read more details via 'Competition Between Catch of Forage Fish for Fishmeal and Human Consumption'

"On a global scale, expanding the production of farmed fish high on the food chain for markets directed toward wealthy consumers has implications for some of the world's poorest

consumers, who consume pelagic fish directly for protein or who consume fish that directly depend on pelagic species," stated a review paper - 'Raising Tigers of the Sea' – published in 2005. "Although some fish used for fish meal and fish oil, such as menhaden, are distasteful to humans, the demand for small pelagic fish for direct human consumption is likely to increase with population growth in the developing world."

"Campaigners in Peru and Chile are now claiming that there are serious environmental and social costs, however – including pollution and health problems, overfishing, and impacts on ecosystems and wildlife – arising from production of fishmeal and fish oil," reported The Ecologist in 2008. "The salmon we produce is eaten by the mouths of people in the USA and Europe, but the asshole is here in Latin America," said Dr. Juan Carlos Cardenas of Ecoceanos. "The true cost of the cheap salmon you eat is being paid with the blood of our people and the health of our oceans."

For more background please watch 'The Greed of Feed'

As you can see, the salmon feed issue is well documented and the links provided here are recommended reading on your flight over to Norway. Or perhaps the in-flight movie will feature this important issue? Norwegian and Swedish TV have both featured the salmon feed problem in the 2009 documentary 'Rosa Gull' and another award-winning film broadcast on TV2.

A BBC documentary broadcast in April as part of the 'Looting The Seas' series by the International Consortium of Investigative Journalists (ICIJ) exposed how jack mackerel stocks in South America are being plundered to fuel the expansion of salmon farms all around the world.

"Jack mackerel might not be familiar at the supermarket fish counter, but you have probably eaten it unaware in bites of farmed salmon," reported the Center for Public Integrity. "Much of jack mackerel is reduced to feed for pigs and aquaculture. It can take more than 5 kilos of jack mackerel to raise a single kilo of salmon. The ICIJ investigation revealed that greed, mismanagement and lack of regulation have devastated the fishery — it went from 30 million metric tons to 3 million in just two decades."

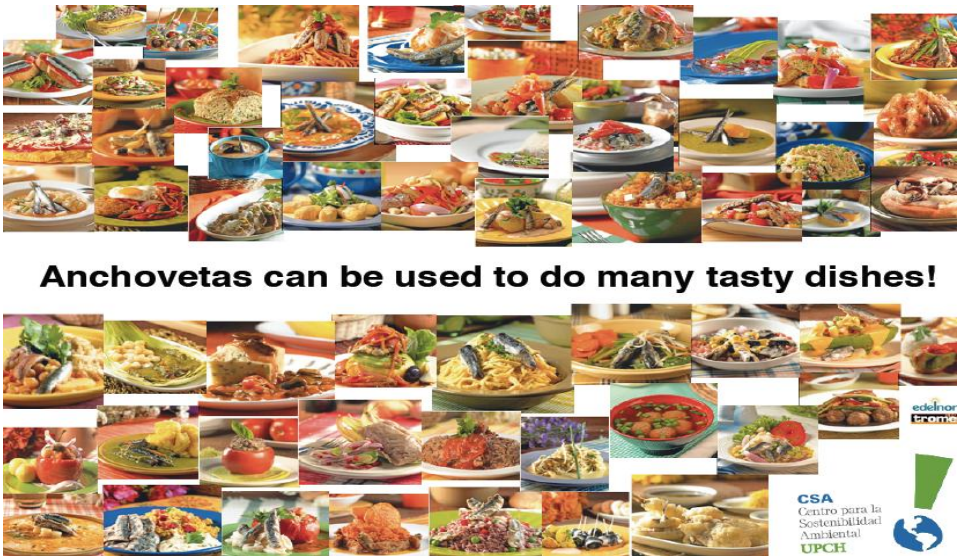
The Public Herald reported (23 April) on the BBC film with the headline: "Sustainable Farm Raised Salmon Help Deplete Jack Mackerel Populations." "Farmed salmon, that ubiquitous pink fish decorated with ribbons of fat, can thank the forage fish of the southern Pacific ocean – like anchovy and jack mackerel – for their calorie-rich diet," reported NPR. "Indeed, more than 5 pounds of jack mackerel typically can go towards raising one pound of farmed salmon."

Just last month at the World Fisheries Congress in Scotland, Brazilian research demonstrated 'forage fish' as a cheap and sustainable source of protein and micronutrients for school children. "So called 'forage fish'- small marine fish, such as anchovies - have traditionally been used to stock fish farms with about 20 to 30 million tonnes used to produce fish meal every year," reported The Fish Site (25 May). "Four million tonnes of which are used in aquaculture to feed carnivorous fish. This practice has come under fire due to its poor return in food value. Indeed, by feeding the fish direct to humans for consumption - eight times as much protein reaches our dinner plates. So why aren't these fish used for direct human consumption? This question has been addressed by Professor Lauro Madureira in

conjunction with the Brazilian Ministry of Fisheries through an innovative and imaginative programme."

Put simply, we should be eating forage fish directly to feed the malnourished around the world rather than feeding forage fish to salmon farms to produce a 'luxury' product to feed the engorged in Europe, the United States and Japan. If you are serious about sustainability then you should cut out the middle-man and stop the flow of forage fish to the salmon farming industry.

As Dr. Patricia Majluf in Peru says:



Why on earth would you waste precious food fish to feed to unsustainable salmon farms?

Finally, we hope you will have time to discuss these concerns before, during or after your visit. It is clear that the conference organizers and sponsor – the feed companies Nutreco and Skretting – have a vested interest in presenting salmon aquaculture as 'sustainable' as well as socially and environmentally acceptable. However, you would be doing the hungry people of the world a serious injustice if you presented salmon farming as anything other than what Dr. Daniel Pauly calls "a giant Ponzi scheme" which is robbing our oceans of fish to feed the rich.

You are always welcome in Bergen and a trip on the 'Eco-Queen' to see first-hand the impacts of salmon aquaculture could be arranged at your convenience. This week we visited salmon farms in the Hardangerfjord and a similar visit could be arranged (watch a TV2 News report online here).

In advance of your visit to Norway, please watch a short video of the waste under a Norwegian salmon farm and another video on the hazards of eating Norwegian farmed salmon. Further information is also available via our report on salmon farming (available in English, French and Norwegian).

Please contact the Green Warriors of Norway if you require any further information in advance of your visit.

Yours sincerely,

Kurt Oddekalv
Leader of the Green Warriors of Norway

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