



Fishing for Catastrophe:

How global aquaculture supply
chains are leading to the destruction
of wild fish stocks and depriving people
of food in India, Vietnam
and The Gambia

The purpose of this report is to shed light on industry-specific issues related to the environmental and food security impacts of the use of wild-caught fish as feed inputs in the aquaculture industry.

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Executive summary

Overview

Based on findings from on-the-ground investigations carried out in India, Vietnam and The Gambia in mid-2019, this report presents damning evidence that the production of fishmeal and fish oil (FMFO) for use in global aquaculture supply chains is precipitating the collapse of fish stocks, compromising food security, and destroying the social and economic fabric of communities living adjacent to historic fishing grounds at a time when the oceans are being pushed to the brink by the impacts of climate change, pollution and overexploitation. Using information gathered from in-depth supply-chain research, the report, which is the first to map FMFO supply chains from fishery to fork, also establishes links between unsustainable - and often illegal - FMFO sourcing practices in the countries investigated and among major European aquafeed companies and retailers.

FMFO is mainly used as an ingredient in feeds for aquaculture and agriculture.¹ Almost one-fifth of the world's annual wild-fish catch is taken out of the ocean for this purpose.² Roughly one-third of FMFO goes to the agri-

Workers offloading "waste" fish, juvenile and other assorted species at Ullal, Karnataka



cultural sector (5% to chickens, 23% to pigs³), but aquaculture became the dominant user of 'reduction fisheries' (which supply fish for FMFO, rather than for direct human consumption)⁴ in the early 2000s.⁴ In 2016, 69% of fishmeal and 75% of fish-oil production went to seafood farming.⁵ Global demand for FMFO is mainly driven by China's huge aquaculture sector,⁶ but export-oriented sectors, such as salmon farming in Norway and Scotland and prawn farming in Asia, are also significant consumers.

The biggest reduction fishery, typically representing 30–35% of world production of FMFO,⁷ is Peruvian anchoveta. However, other regions are also important suppliers of the global market and, as such, require close scrutiny. In Asian countries, where a broader diversity of fish species is used than in South America and northern Europe,⁸ locally produced FMFO often supplies domestic seafood farms with direct or indirect links to overseas retail markets. Our investigations found that in two of the region's key FMFO- and aquaculture-producing countries, India and Vietnam, collapsing fish stocks and the economics of the FMFO industry are pushing fishing vessels to systematically plunder the oceans for species that have not previously been used for FMFO production, as well as juvenile fish, which should be left in their natural environment to reach maturity and ensure a stable fish population.

Increasing demand in major markets – notably China – has also spurred growth in West African FMFO production; according to UN Comtrade figures, in 2016, it produced 7% of the world's fishmeal. Some countries have experienced a particularly steep rise in production; for example, half of Mauritania's fish catch is used to produce fishmeal.⁹ Shockingly, in The Gambia, where GDP was a mere \$1,700 per capita in 2018¹⁰ and people rely on fish as a staple food, our investigation found that the combined catch of just one of the country's FMFO plants accounted for approximately 40% of the country's total reported fish catches in 2016. Gambia's fish catch is turned into fishmeal at a rate of 5 kilos of fish for 1 kilo of fishmeal and exported abroad, mainly to China.

Failures of governance and links to the global market

Using information gathered through detailed supply-chain research and analysis, this report identifies links between unsustainable fisheries for FMFO in Africa and Asia and major players on the global market, including aquaculture companies, aquafeed producers, seafood processors and retailers. It also highlights failings in oversight and governance of the sector, both at regulatory level and on the part of the FMFO trade association and certification body, The Marine Ingredients Organisation (IFFO). We found that FMFO and aquafeed plants with proven links to highly unsustainable fishing practices are certified by, or are members of, IFFO, which has a clear conflict of interests due to its double-hatted role. Our research also found that IFFO membership and certification are used as marketing tools at multiple stages of the supply chain; however, it is clear from our findings that they provide a sustainability smokescreen, preventing further probing by downstream customers of FMFO producers regarding the true impacts of using wild fish to feed farmed seafood. The report concludes that IFFO is wholly unfit to serve as a certification body, and that retailers and aquafeed companies need to stop taking its assurances at face value.

Our research finds that aquafeed companies with unsustainable and illegal sourcing practices are supplying seafood farms exporting to the global market – and, in turn, many of the biggest seafood processors and retailers in the world. **This means that aquafeed companies, aquaculture producers, seafood processors and major retailers are complicit by association in the socioeconomic and ecological damage our investigators encountered.** While our analysis focused on European retail supply chains, we would expect the picture to be broadly similar in other high-income markets, based on the knowledge that the same aquafeed companies and seafood exporters supplying the European market are also exporting to other markets in the Global North, including the US and Canada.

A A reduction fishery is one that uses ('reduces') its catch to produce fishmeal or fish oil, rather than for direct human consumption (see: <http://blog.msc.org/blog/2017/03/22/reduction-fisheries-sustainable-fish-oil/>).

While all the markets we looked at were characterised by a surprising lack of traceability and transparency regarding the origin and supply chain of farmed seafood products, we were able to establish that numerous European retailers are sourcing products from aquafeed companies and seafood processors linked to unsustainable FMFO supply chains. These retailers include:

- **UK:** Sainsbury's, ALDI, Lidl, Co-op, Tesco, Asda, Iceland, Morrison's, Waitrose, Marks & Spencer
- **France:** Auchan, Groupe Casino, Leclerc, Monoprix, Système-U
- **Germany:** ALDI Nord, ALDI SÜD, REWE, Lidl, EDEKA
- **Netherlands:** Albert Heijn, Lidl, Plus
- **Spain:** Mercadona

Summary of key findings from India, Vietnam and The Gambia

Our findings show that FMFO production, driven by demand from the global aquaculture sector, is visibly accelerating the decline of fish stocks in India, Vietnam and The Gambia that marine fisheries for human consumption have already pushed to breaking point. Local fisherpeople and communities are clear-eyed about the consequences for them; they see the slump in catches they are currently experiencing as a precursor to the inevitable destruction of the fisheries that sustain them. However, they feel powerless against the economic might of the industry.

Case study: India

The investigation focused on two regions:

- **The Mangalore-Karwar belt on the West Coast of India:** Mangalore harbour, Malpe harbour, Gangoli harbour and Betul port; fishmeal plants (Ullal Fishmeal plant consortium) and aquaculture operations.
- **Andhra Pradesh on the South East Coast of India:** A region of major production and exportation of prawn, largely dominated by small-scale farmers. Our investigators also visited Vishakhapatnam Port.

Key findings

- Indian fishmeal plants have presented opportunities to monetise juvenile catch, damaged catch or species not previously targeted for fishing. Fisherpeople say that that contrary to these companies' public statements about not using juveniles, they 'take everything', so now 'everything' is being hauled in and ground into FMFO.
- Fish stocks of species traditionally used for FMFO (such as sardines) have collapsed, and new species are appearing in catches, suggesting dramatic changes and imbalances in the ocean ecosystem.
- Some FMFO plants are not operating because of the shortage of fish.
- Fishing bans designed to give marine ecosystems an opportunity to recover are being violated.
- FMFO plants generally bypass traditional auctions and secure a fishing vessel's entire catch with upfront payment, which locks fisherpeople in and encourages unsustainable fishing practices.



Assorted “waste” fish catch being offloaded at Mangalore port to be sent to fishmeal plants

- Significant quantities of ‘food’ rather than ‘trash’ fish are being diverted to the fishmeal plants. Local people rely on locally caught fish for their protein needs, and it is becoming harder for them to compete within the new system.
- Communities are affected by air and water pollution from FMFO production. Locals who speak out are intimidated.
- The entry of non-traditional fisherpeople looking for short-term returns has changed dynamics in the sector: even skilled artisanal fishermen are being pushed into overfishing, which goes against traditional practices.

Indian supply-chain links

Norwegian company Skretting is sourcing fish oil from a number of Indian FMFO companies in Ullal district, several of which are members of IFFO. Many of these companies present their IFFO membership within a ‘certification’ context, which is potentially misleading.

One of the FMFO plants our investigators visited in Ullal, which confirmed it accepted ‘all fish’ for FMFO processing, supplies a number of global aquafeed companies, including Skretting, Mitsubishi Corporation, Godrej Agrovet Limited, Cargill India Pvt. Ltd, Uni-President Feeds, Toyota Tsusho Corporation, CP Aquaculture India Pvt Ltd (part of Thai multinational Charoen Pokphand Group) and Grobest Feeds.

Case study: Vietnam

The investigation team visited three ports in the south of Vietnam which are important fishmeal production hubs:

- **Tac Cau port, Kiên Giang Province**
- **Song Doc port, Cà Mau Province**
- **Phuoc Tinh port, Bà Rịa-Vũng Tàu Province**



Trash fishes including sardines, mackerels are sold to fishmeal factories in Ca Mau, Vietnam

Key findings

- Significant underreporting of catches is enabling overfishing to continue unchecked. Catches destined for fishmeal factories are not being reported to authorities.
- Unauthorised transshipment (the transfer of catch from one vessel to another at sea) of both market and ‘trash’ fish for fishmeal production occurs regularly.
- Fish stocks are in decline; for example, fishermen in Vũng Tàu Province reported their lowest catches ever in 2018, due to overfishing for fishmeal.
- Lack of fish is leading to widespread fishing in foreign waters, which stokes regional tensions.
- Highly unsustainable fishing techniques are being used, and fishing is indiscriminate, targeting species not traditionally used for FMFO.
- Owners of fishing vessels depend on financial loans from fishmeal factories and middlemen to keep their boats running. These loans tie them into exclusive supply agreements. As a result, fisherpeople feel trapped in a vicious cycle.
- Pollution from fishmeal production is blighting communities’ lives.
- There are widespread fears in Vietnam that the EU will ban (‘red card’) Vietnamese seafood imports due to the continued prevalence of illegal, unregulated and unreported (IUU) fishing.

Vietnamese supply-chain links

Investigations at Tac Cau port found IUU fishmeal from Phuoc Ngoc fishmeal plant to be entering the supply chain of Vinh Hoan Corporation, a large aquafeed producer and leading Vietnamese pangasius exporter to the EU. This fishmeal is also entering the supply chain of CP Vietnam, the feed subsidiary of global giant CP Foods, part of Thai multinational conglomerate Charoen Pokphand Group.

Investigation at Song Doc port found IUU fishmeal from Bich Khai fishmeal plant to be entering the aquafeed supply chain of leading feed producer, Grobest, which supplies to Vietnam’s largest prawn exporter, Minh Phu - a company that exports significant amounts of seafood to the EU and US, including Europe’s leading prawn supplier, Heiploeg International. Heiploeg is owned by Dutch fishing giant, Parlevliet & Van der Plas^B

Investigations at Phuoc Tinh Port found that IUU fishmeal from Phuoc Loc fishmeal plant was entering the aquafeed supply chain of CP Vietnam, also part of Charoen Pokphand Group.

Case study: The Gambia

^B Parlevliet & Van der Plas states on its own website: ‘The fish caught by the vessels of Parlevliet & Van der Plas is solely intended for human consumption. It is not meant for conversion into fishmeal.’ (see: <https://www.pp-group.nl/fishing>)

Our investigation covered all three operational FMFO plants in The Gambia, which are located along a 30-kilometre stretch of coastline in the villages of Sanyang, Gunjur and Kartong, just over the border from Senegal.

Key findings

- The combined fish catch of just one of The Gambia's FMFO plants accounted for approximately 40% of the country's total reported catches in 2016, revealing the massive scale of this new industry in the country.
- FMFO destined for human consumption is being exported without legally required food-safety certificates.
- Pollution from FMFO production is damaging The Gambia's budding ecotourism industry.
- At least one Gambian plant sells most of its fishmeal to Vietnam; it is then re-labelled on the black market for re-export to China, the world's largest aquafeed producer. This circumvents more stringent Chinese food-safety controls and the absence of a fishmeal export agreement between The Gambia and China.

Local woman selling fresh fish, the same type as are sent to the FMFO factories



Gambian supply-chain links

Neither the FAO nor the government has records of Gambian FMFO production or exports, even though fishmeal plants have been operating in the country for some years.

However, our investigation found that all three plants have been exporting FMFO illegally. They transport these products in large containers that are shipped abroad by major international logistics companies, including Maersk, according to the Gambian Food Safety and Quality Authority - which only discovered this after our investigators questioned them. Our questioning prompted the government to temporarily halt their exports.

From May 2017, the three plants had been exporting their FMFO destined for human consumption and feed without securing the required food-safety certificates, potentially avoiding export fees and falsifying food-safety certificates - meaning the FMFO did not undergo any food-safety controls or inspections. This reveals serious gaps in international oversight on food security and product traceability, putting consumers' safety at risk.

A shroud of secrecy surrounds the FMFO plants' international clients. Nonetheless, an entry in the Oceans Disclosure Project database shows that Danish aquafeed company, BioMar, sourced round sardinella from The Gambia in 2018.¹¹ Export data also reveals shipments to Vietnam, Thailand, Saudi Arabia, Tunisia, Mauritania and Chile - a number of which are hubs for aquafeed production with strong supply links on to North America and Europe. Our investigation confirmed that one of the main importers of Gambian fish oil is Chilean company, TRIO S.A., which would have been importing fish oil from The Gambia without proper food-safety certificates. This company is part of a conglomerate, TRIOGROUP, which exports to the US and the UK, among other international markets.

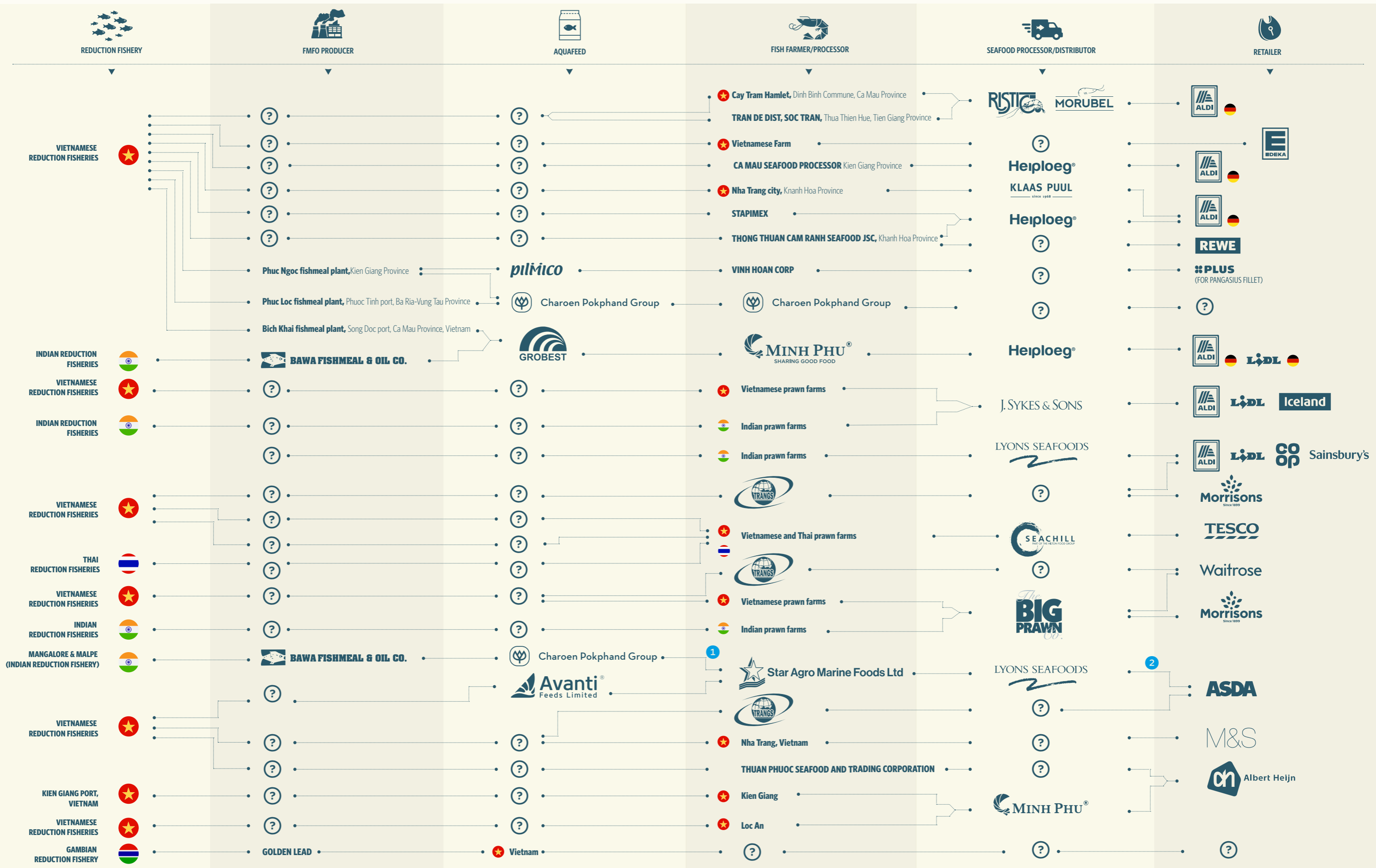
Worker operating boiler at fishmeal and oil company at Ullal, India



Golden Lead - The Gambia's main FMFO plant, which is responsible for most of the environmental crimes the industry is committing - has exported fishmeal to one company that is a member of IFFO and another, in Vietnam, which serves as a black market conduit to the Chinese market.

European retailer links to reduction fisheries - prawn

THE INFORMATION DISPLAYED HERE WAS OBTAINED FROM A VARIETY OF PUBLICLY ACCESSIBLE SOURCES, IN-STORE VISITS, INTERVIEWS AND OUR COUNTRY INVESTIGATIONS. IT MUST BE NOTED THAT WITHOUT TOTAL TRACEABILITY AND TRANSPARENCY, IT IS IMPOSSIBLE TO ESTABLISH AN EXACT CHAIN OF CUSTODY OF A GIVEN QUANTITY OF RAW FISH THROUGH FMFO PRODUCTION TO AQUAFEED AND THEN SEAFOOD FARM BASED ON DATA AVAILABLE IN THE PUBLIC DOMAIN. IN CASES WHERE WE HAVE BEEN ABLE TO ESTABLISH THAT A FMFO PLANT IS SUPPLYING A SPECIFIC AQUAFEED COMPANY AND THAT THAT AQUAFEED COMPANY SUPPLIES A FISH FARM OR RETAILER, THIS IS INDICATED FOR ILLUSTRATIVE PURPOSES TO DEMONSTRATE THE CONCERNING IMPLICATION OF EUROPEAN RETAILERS AND AQUAFEED COMPANIES WITH HIGHLY UNSUSTAINABLE PRACTICE AT THE FISHERIES LEVEL.

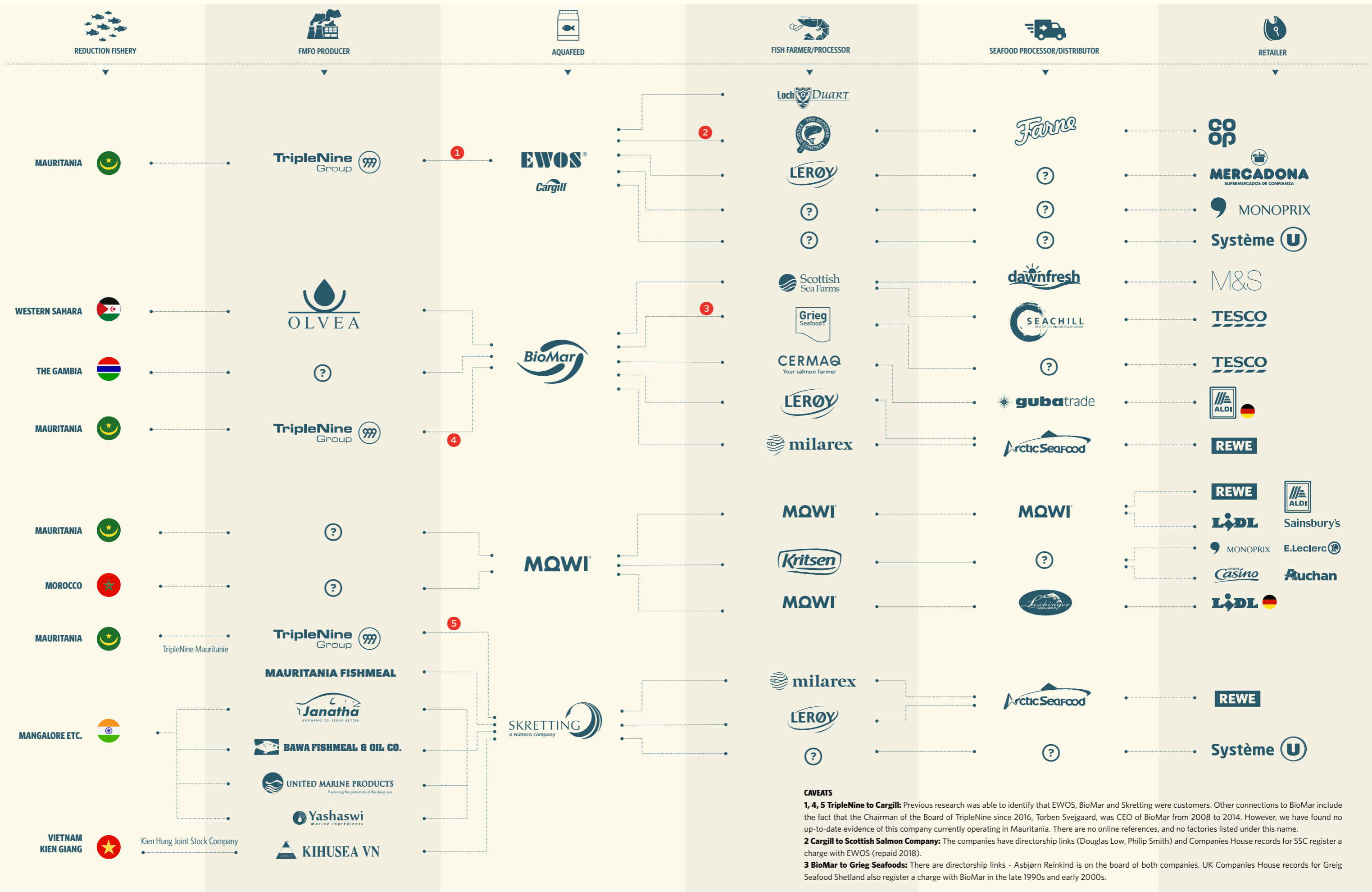


1 CP Foods > Star Agro: This comes from a 2014 corporate presentation obtained by Changing Markets but could easily have changed over the past five years

2 Star Agro > Asda: industry news articles strongly suggest ASDA use Lyons for its own-brand shrimp supply. In June 2018 it ended its contract with Young's and signed with Lyons according to industry sources, and one report stated that it is "understood that whitefish and prawn own-label work is involved in the contract."

European retailer links to reduction fisheries - salmon

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CAVEATS

1, 4, 5 TripleNine to Cargill: Previous research was able to identify that EWOS, BioMar and Skretting were customers. Other connections to BioMar include the fact that the Chairman of the Board of TripleNine since 2016, Torben Svejgaard, was CEO of BioMar from 2008 to 2014. However, we have found no up-to-date evidence of this company currently operating in Mauritania. There are no online references, and no factories listed under this name.

2 Cargill to Scottish Salmon Company: The companies have directorship links (Douglas Low, Philip Smith) and Companies House records for SSC register a charge with EWOS (repaid 2018).

3 BioMar to Grieg Seafoods: There are directorship links - Asbjørn Reinkind is on the board of both companies. UK Companies House records for Grieg Seafood Shetland also register a charge with BioMar in the late 1990s and early 2000s.

The future of feed

On the basis of this evidence, this report analyses the risks that irresponsible sourcing of feed raises for companies throughout aquaculture supply chains. It finds that the sector's continued dependence on wild fish for use in aquafeed represents a systemic threat for companies, with FMFO and aquafeed producers being particularly vulnerable. Through their increasing reliance on farmed seafood fed using FMFO, other sectors - such as seafood processing and retail - are also exposed to these risks, which include disruption of supply, rising costs of raw materials and reputational damage.

The report concludes that, given soaring demand from the aquaculture sector, endemic ecological and social problems in FMFO supply chains, and global fish stocks dwindling to historic lows, FMFO from whole wild fish has no place in the future of feed.

Alternative solutions that make it possible to produce aquafeed without using wild-caught fish need to be scaled up and rolled out across the industry. It is critical that these alternatives are truly sustainable, and do not disrupt and destroy natural habitats and ecosystems. In addition, the current model of carnivorous fish-rearing needs to give way to greater breeding of omnivorous and herbivorous fish, or species that require no external inputs, coupled with a substantial reduction in consumption of unsustainable farmed seafood.

Recommendations

Eliminating the use of wild-caught fish to feed farmed fish, and the related social and environmental impacts of the FMFO industry documented in this report, will require the involvement of a range of different actors, including aquafeed producers, aquaculture companies, certification schemes, retailers, policymakers and consumers.

Aquafeed industry

- Switch from using wild-caught fish for feed to more sustainable alternatives. While some companies are taking initial steps towards reducing their reliance on fish in a selection of their aquafeed products, the use of fishmeal and fish oil (FMFO) needs to be phased out across the entire industry for transformational change to take place. Companies should also stop using FMFO to feed other animals, such as pigs, chickens and mink.
- Ensure alternative feed sources do not give rise to other social and ecological problems. It is critical that the industry understands and minimises negative impacts linked to other sources of feed; for example, there are huge environmental and social problems linked with expansion of soybean and palm-oil production, which are currently not sufficiently addressed by any existing sustainability initiatives.^C

Aquaculture industry (fish farms)

- The industry should prioritise cultivating species that do not require feed (e.g. shellfish), that require fewer inputs (e.g. tilapia) or that can be fed an entirely vegetarian diet (e.g. carp). For species that require feed, it should push aquafeed producers to provide genuinely sustainable alternatives to aquafeed containing FMFO. The aquaculture industry must be willing to share the additional cost that sustainable alternatives may entail.

Certification schemes

- Reduction fisheries should not be certified. Certifying reduction fisheries gives a false impression that exploiting wild-caught fish for use in fishmeal and fish oil (FMFO) can be sustainable. Wild-caught fisheries certification schemes, such as the Marine Stewardship Council, should stop certifying fish that is not used for direct human consumption, while aquaculture certification schemes should only certify farmed fish not reliant on the use of FMFO from whole wild-caught fish.

^C We have explored in detail the problems with numerous voluntary initiatives and certification schemes (including MSC and Roundtable for Sustainable Palm Oil) in our previous report, *The false promise of certification*, available here: http://changingmarkets.org/wp-content/uploads/2018/06/THE_FALSE_PROMISE_OF_CERTIFICATION_FINAL_WEB.pdf.

Retailers

- Provide full transparency about farmed seafood supply chains - from the identity of their suppliers and processors, to aquafeed companies, fishmeal and fish oil (FMFO) producers, and the location of reduction fisheries.
- Commit to avoiding seafood reliant on FMFO inputs from whole wild-caught fish. Retailers should put in place a roadmap for eliminating the use of FMFO in their products, and conduct regular audits to ensure this is being implemented.

Policymakers

- Implement stricter regulations on due diligence and transparency in aquafeed supply chains. Governments and policymakers should strengthen governance frameworks to eliminate illegal, unregulated and unreported fishing and slave labour, prevent overfishing, and enhance transparency and reporting in global fisheries supply chains.
- Develop guidelines for sustainable feed ingredients. Policy should support the development of alternative feed industries and provide incentives for a transition to more sustainable ingredients. Policymakers should encourage a range of alternatives to whole wild-caught fish that do not result in the destruction of natural habitats and ecosystems, as well as other innovative and truly responsible approaches.
- Governments should support the phase-out of whole wild-caught fish for use in aquafeed. Furthermore, aquaculture that relies on wild-caught fish should not receive any subsidies or other public support measures.

Consumers

- Diversify consumption of seafood to include fewer species reliant on feed containing FMFO - especially carnivorous farmed species, such as salmon and prawns. Through their purchasing decisions, consumers have an opportunity to send a clear message to the industry that they care about the impacts reduction fisheries have on people and the environment. They can do so by opting for species not cultivated using FMFO and reducing consumption of unsustainable farmed seafood products.
- Show companies that they care by contacting retailers and seafood farmers and spreading the word



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