The Edible Fats and Oils Challenge

Background:
Insights and Trends

April 2019

Acknowledgements

This publication has been produced by international sustainability non-profit Forum for the Future, in collaboration with its partners M&S, WWF and Volac-Wilmar.

The content draws on interviews with experts across the supply chain, together with desk-based research and input from a multi-stakeholder workshop in June 2018.

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Our Plan for Industry to Collaborate

Forum for the Future, M&S, Volac-Wilmar and WWF are inviting organisations to join the Edible Fats and Oils CoLab.

This three-year multi-stakeholder initiative is focused on accelerating the sustainable production and use of edible fats and oils.

To find out more, read Our Plan for Industry to Collaborate.

Introduction

Edible fats and oils are an essential part of a healthy and nutritionally balanced diet for humans and livestock. Yet this food group is an integral part of an increasingly fragile food system, with deep inequalities and public health challenges, as well as practices that are wreaking havoc on biodiversity, groundwater reserves, soil health and the carbon cycle.

Taking stock of the trends shaping the sector, it is clear that the future is likely to look very different from today.

In this report, we outline the key trends and issues that will impact the future of edible fats and oils. Whilst there is much uncertainty, there are some trends that we can be reasonably confident about and that are likely to form the backdrop to the different possibilities for the future.

The trends are grouped into three categories: First are **megatrends** that provide the big picture 'operating context'; second are trends shaping the **mainstream** industry today; third are signals of change, the **disruptive** innovations that could shake up the system.

The trends were prioritised based on interviews with experts across the supply chain, together with desk-based research and input from a multi-stakeholder workshop in June 2018.

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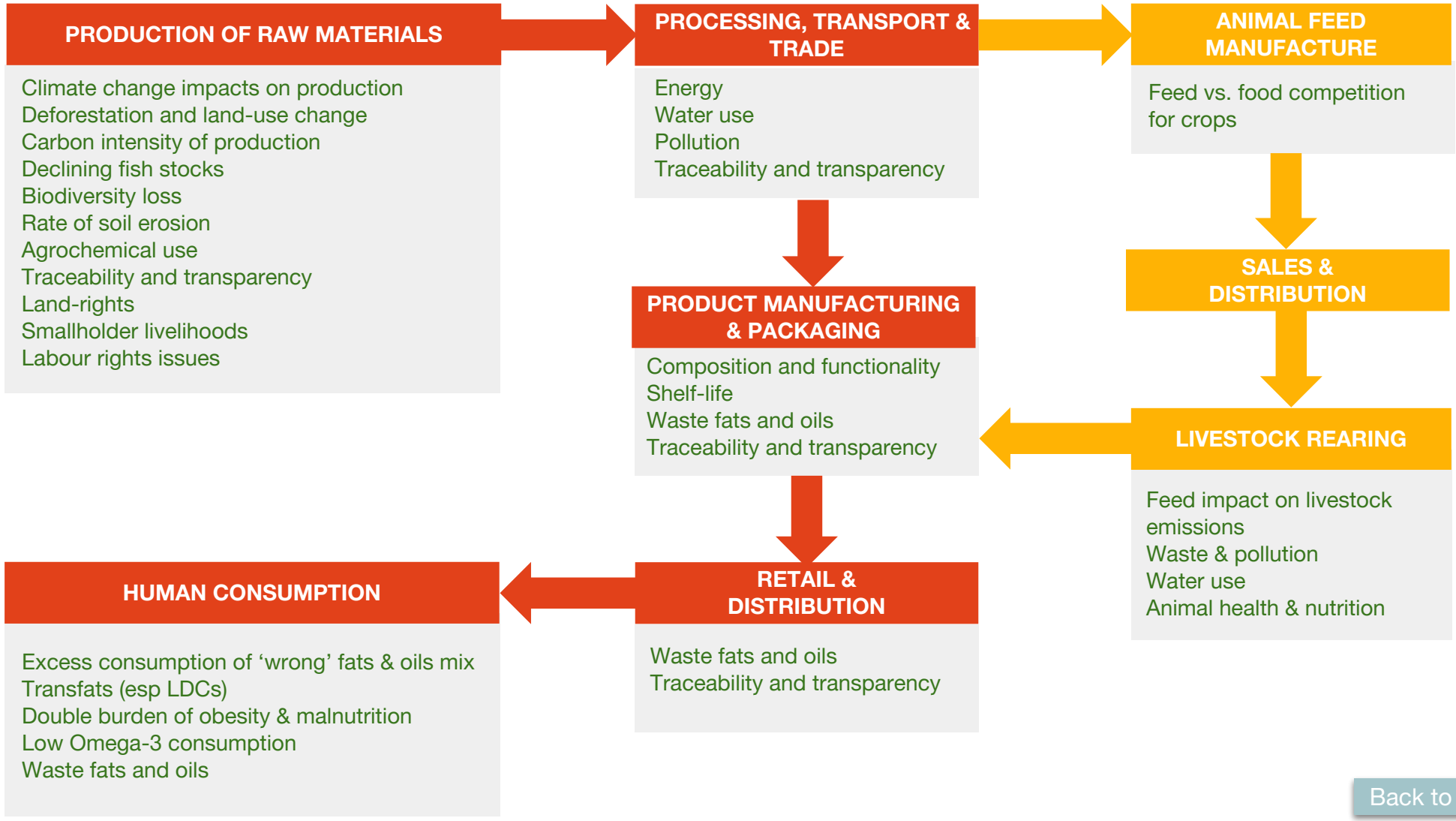
This report is part of the Edible Fats and Oils Collaboration, a multi-stakeholder initiative that sets out to better understand the system and take action to accelerate the sustainable production and use of edible fats and oils.

The initiative is facilitated by Forum for the Future. To enquire about getting involved, please contact Ivana Gazibara: I.Gazibara@forumforthefuture.org

Challenges across the value chain

There are many challenges across the value chain of the edible fats and oils sector with some of the most prominent ones summarised below. Many of these will intensify as demand grows.



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Megatrends

These trends and issues cover the big picture ‘operating context’ and we can be reasonably confident about many of them.

Increasing demand

As the world population heads towards 10 billion, consumption of fats and oils is expected to rise by around one sixth by 2030 and one third by 2050.

The largest increases in demand for fats will occur in China, India and other middle-income countries.

In developed countries, increases are most likely to be for vegetable oils *if* people start to follow dietary guidelines to eat less saturated fat.

How might we help meet and shape these demands, so that everyone has access to the right types of fats and oils in the future?

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Land use and competition

The 2015 High Carbon Stocks Study proposed that in order to meet the predicted increase in demand for edible and non-edible vegetable oil by 2025, an additional 73 million hectares of oil crops would be needed, of which:

- 36 million would be soybeans;
- 22 million rapeseed;
- 11 million oil palm;
- 4 million hectares sunflower.

Crop expansion to meet future demands would need to happen in the context of competition for other land uses, such as biofuels, other foods, animal feed, fibre, carbon sequestration and most critically, biodiversity, conservation and rewilding.

How can additional oil crop production be met, in the context of other competing uses of land?

How scalable are the novel sources of oils, and what challenges and opportunities do they present for the system?

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Changing diets & public health

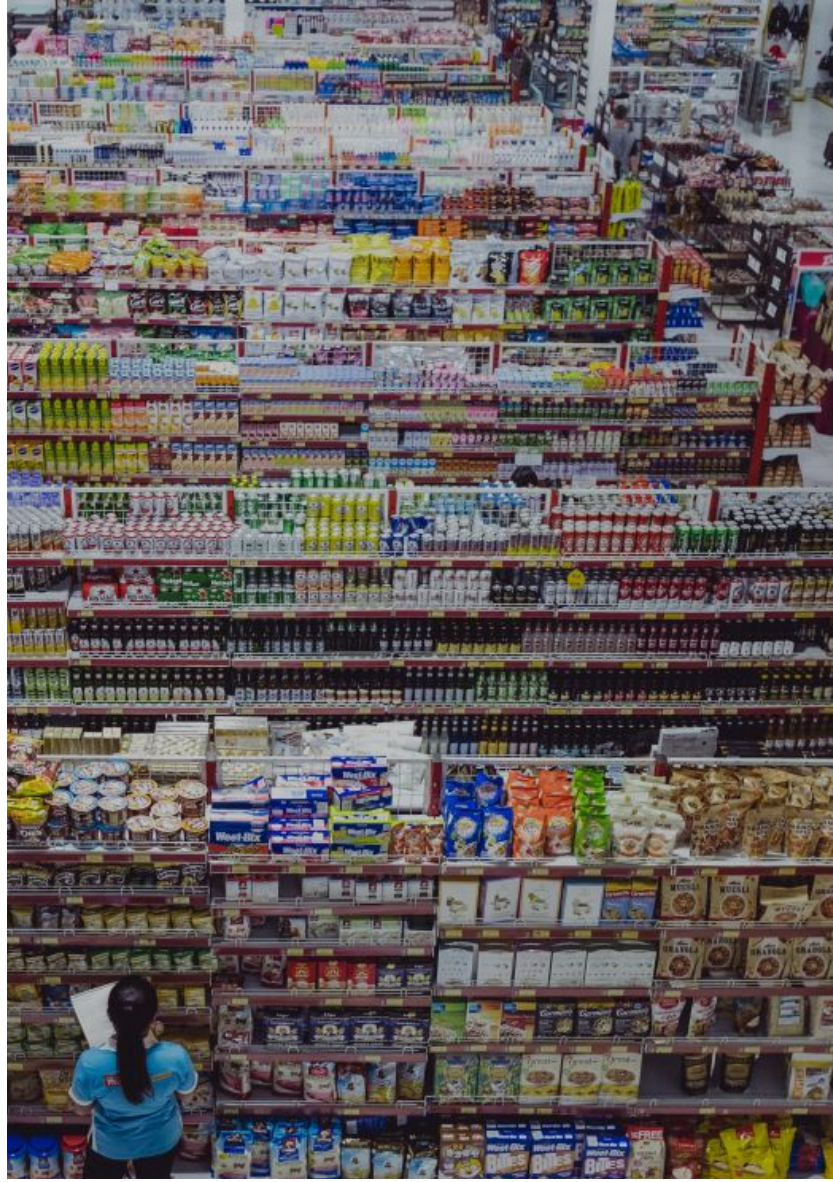
Consumption of sugar, oils, dairy and meat is increasing in almost all regions of the world. Drivers include urbanisation, demographic shifts, education, a growing global middle class and a culture that doesn't promote or support healthier eating.

The health impacts of these shifts include higher rates of obesity and associated chronic diseases. These are now recognised as one of the biggest challenges faced by both developed and developing countries.

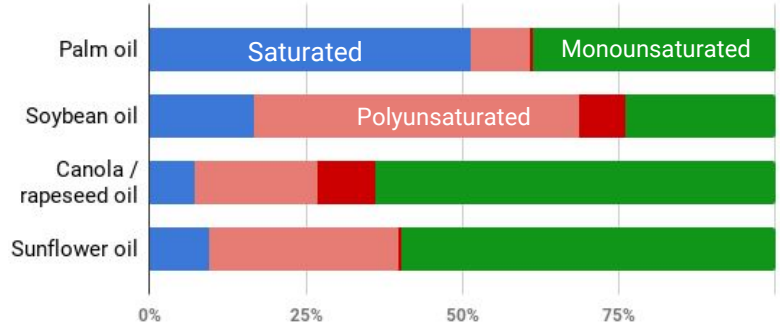
Getting the right nutrition, including the right fats and oils in our diet, is critical to tackling this health crisis. There is growing interest in health and nutrition as people become aware of the impact of diet on long term health.

What can companies do to encourage a healthy consumption of fats and oils?

How might dietary guidelines influence businesses and the public to choose fats and oils that are good for their health, and good for the planet?



Nutritional profile of different fats and oils



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Climate Breakdown

Climate impacts from land-use change and agriculture are more firmly on the agenda since the 2015 Paris Climate Change agreement and latest IPCC reports.

There's now a collective effort to limit global average temperatures to 1.5°C and if we're serious about meeting this, we have to find ways to eliminate, as far and as rapidly as possible, all emissions, not just those from energy.

The agriculture, forestry and land use sector is responsible for approximately 24% of global emissions. It is essential to radically reduce the impact of all agricultural sectors, and to improve their ability to meet nutritional needs in the face of an increasingly challenging climate.

Increasing evidence shows how climate change will significantly reduce both yields and nutritional value of key crops. Challenging weather patterns are already happening and disrupting production.

What might the edible fats and oils sector look like when undergoing rapid societal decarbonisation?

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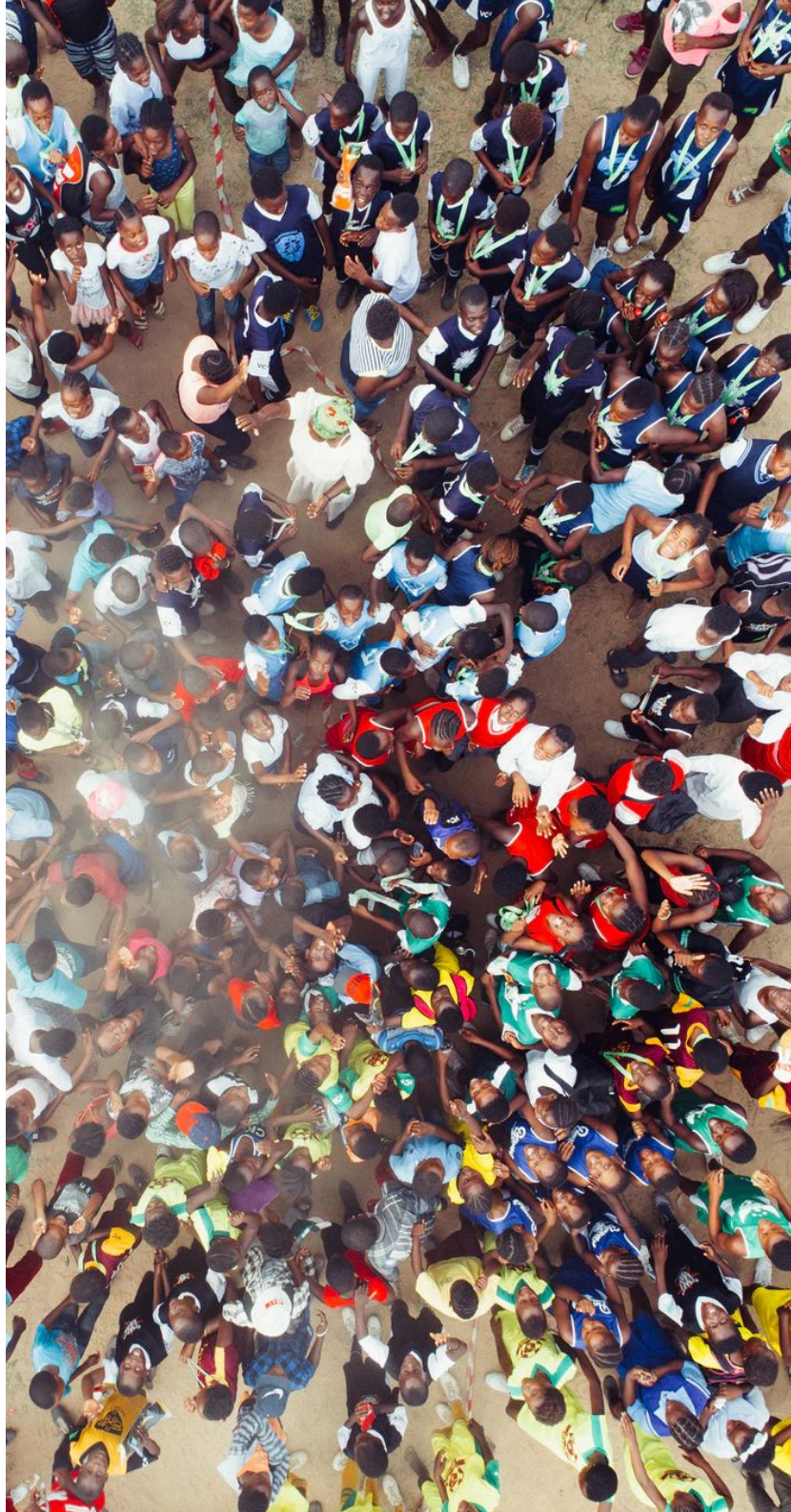
Inequality and changing livelihood expectations

The 2017 World Economic Forum Global Risks report ranked rising income and wealth disparity, and increasing polarisation of sectors of society, first and third among the trends that will determine the shape of the world in the next decade. In extreme cases. these trends can result in social and political instability and conflict.

Many countries rely on agricultural commodities to create jobs and improve livelihoods. However, they are also often areas where there are negative social impacts such as child or forced labour and poor health and safety conditions for workers.

Soybean and palm oil production, for example, has been associated with poor labour conditions and violations of human rights.



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Trends shaping the fats and oils system

What’s shifting in mainstream industry?

The death of trans fats?

Oils can be modified to have desirable characteristics for commercial baking or deep frying, such as a fat that fries at high temperatures without burning and is more solid at room temperature. However the processes that modify oils, such as hydronation, can produce trans fatty acids, or trans fats. Trans fats also occur naturally - in small quantities - in dairy products and ruminant meat.

The overconsumption of trans fats raises the risk of heart disease, stroke, and diabetes - and they can often be replaced by healthier alternatives at no additional cost. Therefore many countries have eliminated industrially-produced trans fats through legally imposed limits on the amount that can be contained in packaged food.

In 2004, Denmark was the first country to mandate restrictions on trans fats - following this, cardiovascular disease deaths declined more quickly than in comparable OECD countries. Following Denmark’s lead, in 2007, New York City began phasing out industrially-produced trans fats.

In May 2018, the World Health Organisation (WHO) called for the elimination of industrially-produced trans fats by 2023, the first time they called for a total global ban on the use of a food ingredient. Since then, the European Commission has also taken steps towards a trans fats ban and is consulting food manufacturers and retailers.

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The search for substitutes

In response to consumer pressure, negative media coverage, NGO and investor activity, many companies are searching for alternatives to palm oil and soy.

In Europe, the retailer **Iceland** announced an intention to remove palm oil from their own-brand products, citing the frustrating lack of progress on preventing deforestation in the sector.

In 2014, **Ecover** tried to substitute in an algal oil for palm oil, but had to suspend the operation because of opposition to the method's reliance on Brazilian sugar and synthetic biology.

While still niche, the market for palm-free options continues to grow. There are now a number of products which actively and explicitly advertise their palm oil-free status.

Companies are showing there are alternatives to explore when substituting palm, however alternatives are often produced in smaller volumes in undeveloped supply chains, with unclear sustainability profiles.

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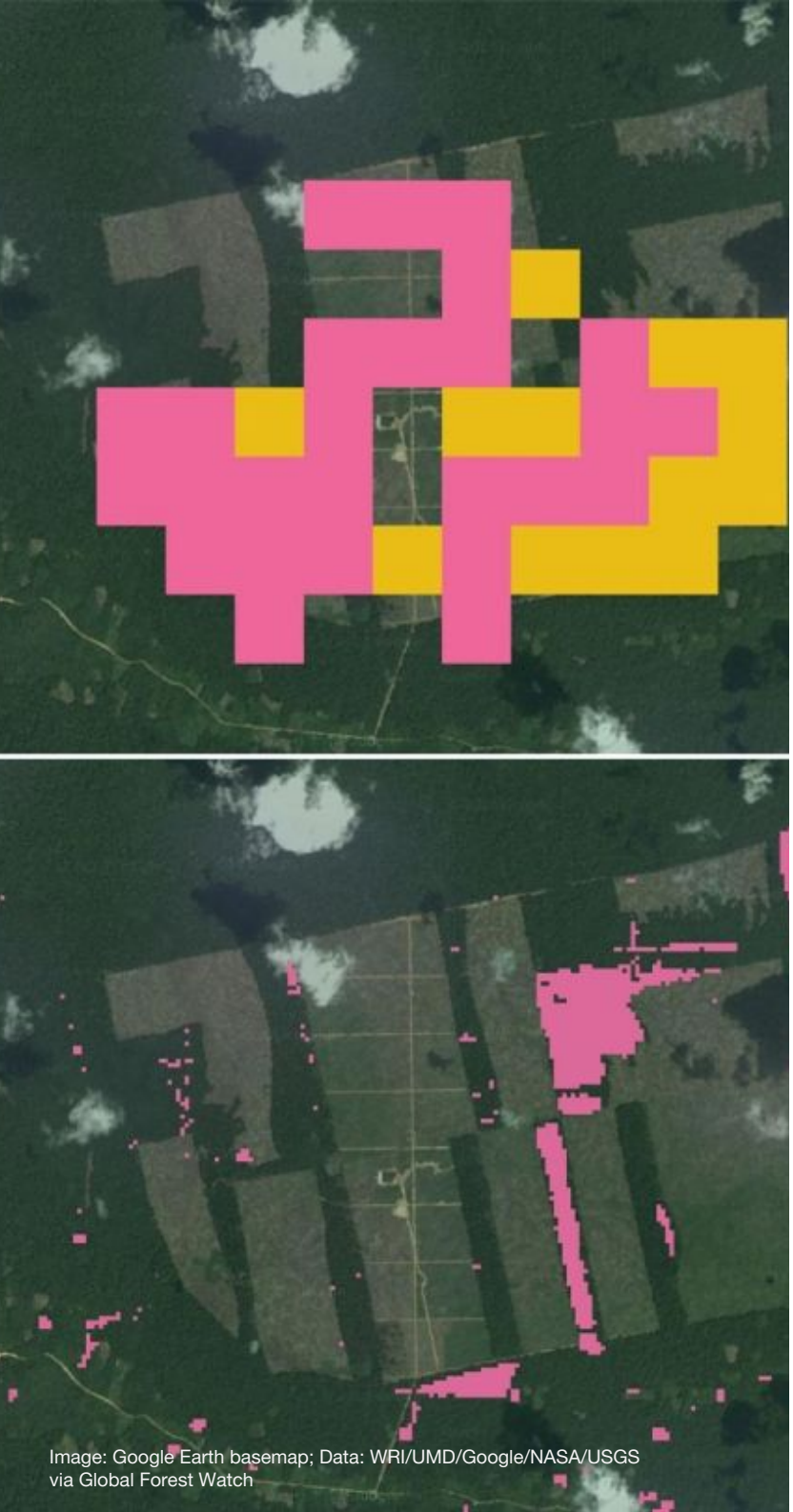

Image: Google Earth basemap; Data: WRI/UMD/Google/NASA/USGS via Global Forest Watch

Transparency

The growth of transparency in business and supply chains continues apace. Developments include new geospatial mapping tools such as TRASE that enable more focus on areas of deforestation, live satellite data on land use such as Global Forest Watch and tools that instantly evaluate nutritional qualities and freshness of food.

Since commodities are aggregated from different sources are mixed at multiple stages, it is difficult to trace fats and oils through the supply chain. This remains a major concern because production has often been connected with the destruction of forests and carbon rich peat soils, as well as the exploitation of local communities and workers.

The use of certification is also limited: whilst 19% of all global palm production is certified sustainable, in contrast only 2% of soybean production is certified. The seafood industry - where we derive our omega-3 oils from - has been repeatedly exposed with reports of slavery in its supply chains, which it has as yet failed to address.

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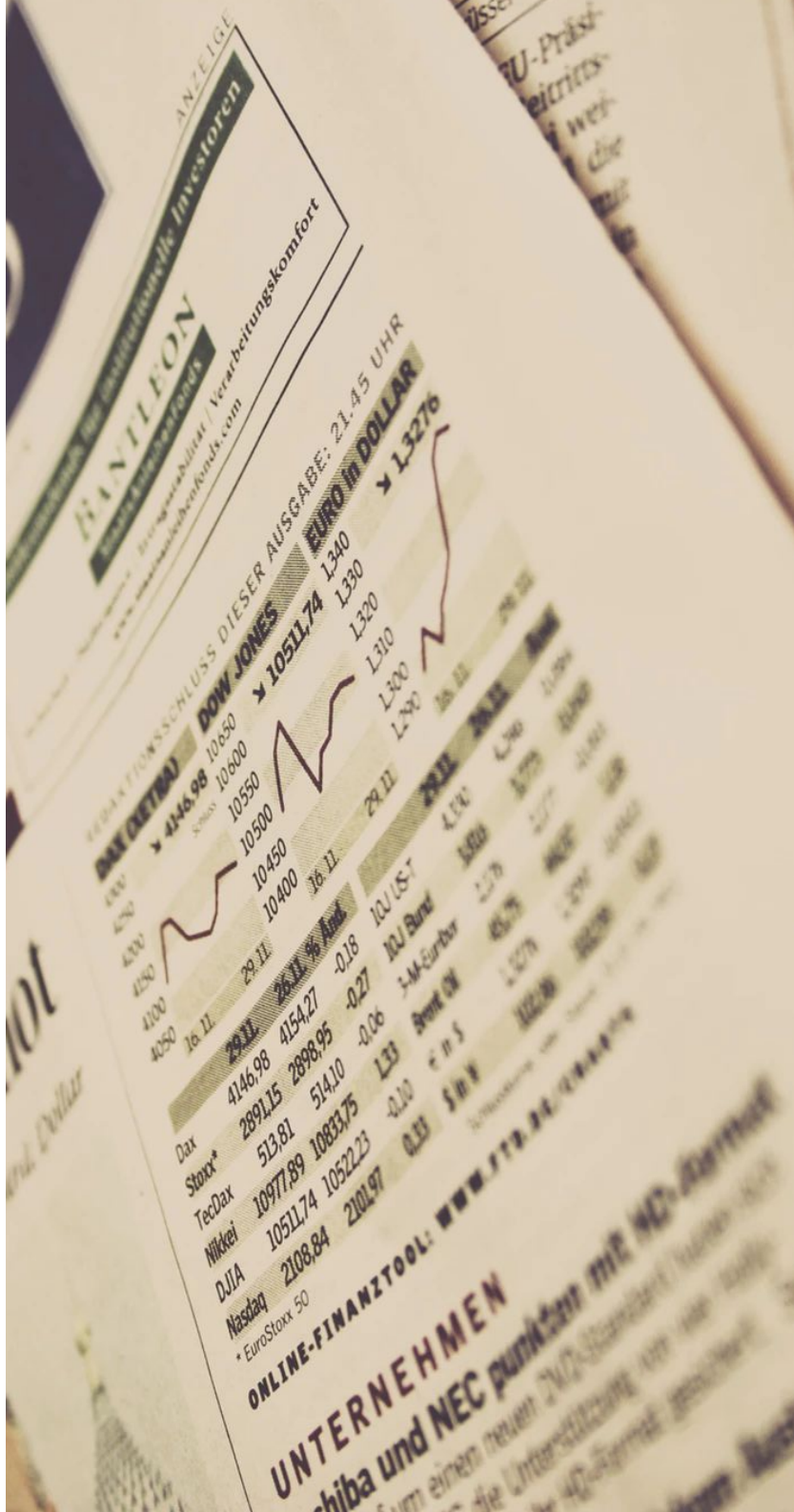
Financing change

Pressure is increasing on investors to address business risk in the palm oil supply chain through direct engagement with their portfolio companies and by supporting relevant policies and multi-stakeholder collaborations.

The potential is huge: investors have the power to transform the palm oil industry by encouraging the companies they finance to adopt more responsible policies on deforestation, land conflicts and labour conditions.

Ten banks, including Rabobank and Santander have formally adopted the **Soft Commodities Compact**, which aligns the banking industry with **The Consumer Goods Forum's** resolution to help achieve zero net deforestation in their supply chains by 2020.

Banks like **Standard Chartered** and **HSBC** - which have previously come under fire for their palm oil-related lending - have tightened their lending practices in this area. In 2015, over 80 investors managing more than $5tn in assets put their name to a letter criticising the Roundtable on Sustainable Palm Oil (RSPO) for "lagging behind" commitments made by some consumer brands.



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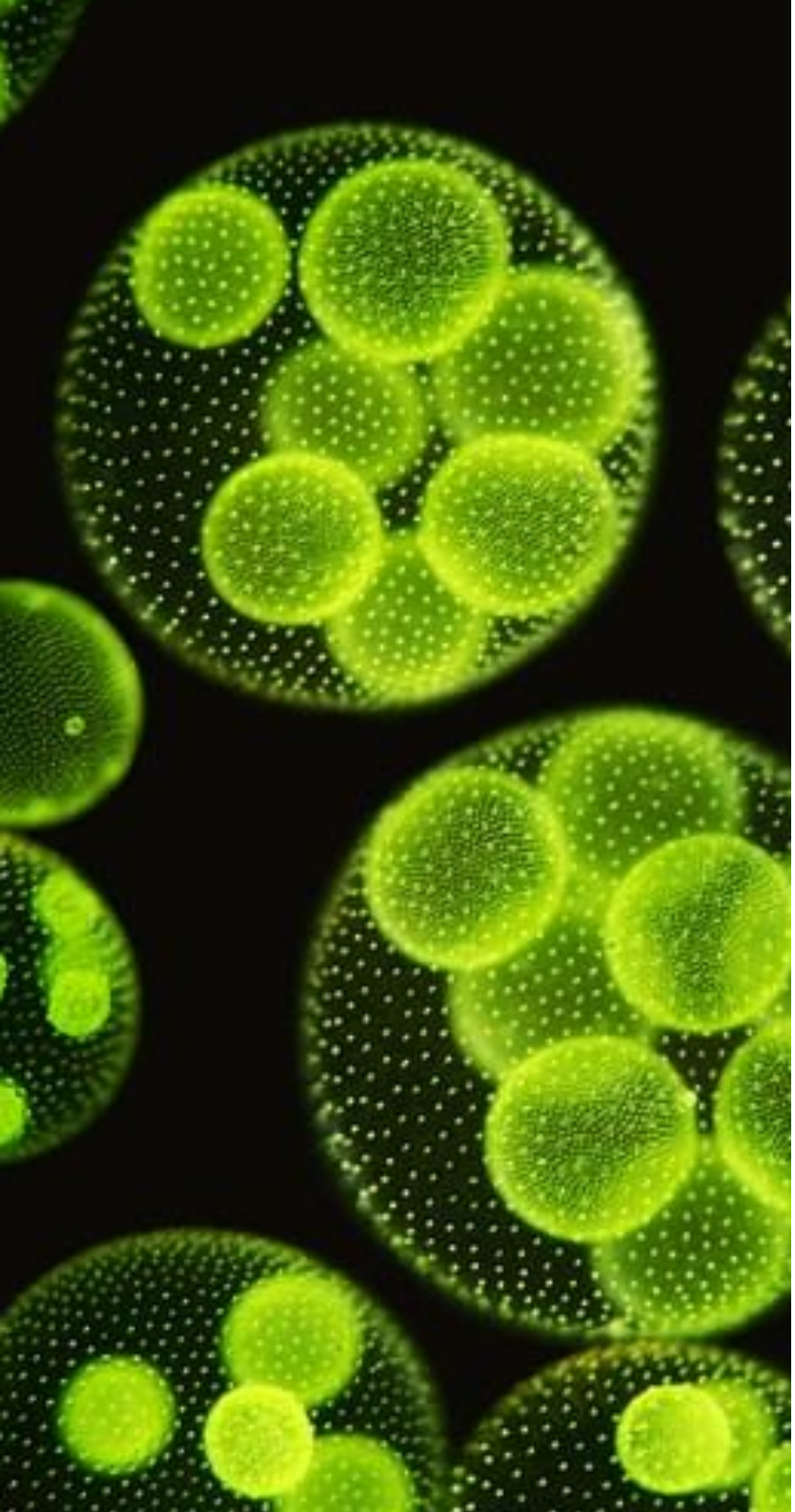
Signals of change

What are the disruptive innovations that could shake up the system?



The rise of algae

Innovators and start-ups across a range of sectors are aiming to harness fats and oils from algaes, in a market predicted to reach $45bn by 2023[1].

Microalgae (single-celled algaes such as phytoplankton and chlorella) and macroalgae (e.g. seaweeds and kelp) are believed to hold potential to scale as future sources of oil.

Innovators such as **Corbion** are creating a range of algae-based products for food, nutrition and ingredients. **BioMar,** a global leader in aquaculture has also launched fish feed with marine fatty acids from microalgae.

1. Credence Research (2016). Global Algae Product Market, May 2016.

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Regenerative agriculture grows in momentum

Regenerative agricultural practices are increasingly recognised as necessary response to the challenges of our changing climate, the depletion of soils and ambitions to sequester carbon.

Many of the techniques and approaches in regenerative agriculture are not new - and can be found within other approaches such as organic agriculture. Practices include intercropping, greater crop diversification, precision inputs and agroforestry. As well as improving farm management practices, technologies can also support regenerative agriculture, such as new machinery and robotics, advanced biologicals and monitoring technologies.

In 2018, **Carbon Underground** in partnership with **Ben & Jerry's (Unilever), DanoneWave, Annie's (General Mills)** and **MegaFood**, started developing a global verification standard for food grown in a regenerative manner.

In 2018, **General Mills** announced a sourcing agreement to convert 34,000 acres of conventional farmland to certified organic acreage by 2020.

What does the production of fats and oils look like in a world where regenerative agricultural practices are scaled up?

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Insect fats and oils

One of the co-products of insect production are lipids that can be used as an alternative to vegetable oils and animal fats.

Europe's two largest insect producers, **Protix** and **Ynsect**, both market lipids products formulated for aquaculture, livestock feed and pet foods. Both companies have received considerable investment in recent years and are now scaling-up with new production facilities.

Another innovator, **AgriProtein**, that uses insects to convert organic waste into oil and protein products, recently closed their second investment round, raising $105 million in June 2018.

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Yeast-derived oil

The yeast *Metschnikowia pulcherrima* can grow on a variety of agricultural and food wastes and with slight changes to the growth conditions, it can be made to produce a thick oil with nearly identical properties to palm oil.

Funded with a £4.4 million government grant, a University of Bath team is exploring how to scale up production and calculating how sustainable it can be. Three companies are working with the university on the project, which is also seeking private equity investment.

Palm oil is a volatile market that can retail at anything between $500 to $1,200 per tonne. The University of Bath team believe they are looking at a $1,000 per tonne price point for the yeast-derived oil.

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Join the **Edible Fats and Oils** Collaboration

Forum for the Future, together with M&S, Volac-Wilmar and WWF are inviting organisations to join the Edible Fats and Oils Collaboration.

This three-year, global multi-stakeholder initiative is focused on accelerating the sustainable production and use of edible fats and oils.

This collaboration is open for food and agricultural companies from across the supply chain, together with NGOs, investors and policy-makers. Together we will:

1. **Reframe the debate:** supporting organisations to take sustainability and health into account concurrently when making decisions.
2. **Create greater alignment around the direction of innovation in edible fats and oils.**
3. **Drive change across key influencer groups:** including key companies in the value chain, investors and policy-influencers.

The collaboration is facilitated by Forum for the Future. To enquire about getting involved, please contact Ivana Gazibara: I.Gazibara@forumforthefuture.org

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