



Global
Insights

Making sustainability a reality: From EU regulations to circular product design



Europe

In this e-magazine, we share a selection of the most popular articles published in 2024 on *Fi Global Insights* that highlight just some of the many strategies food and drink brands can employ to make their supply chains and products more sustainable. With the upcoming EU regulation on deforestation due to take effect this December, inaction is no longer a possibility.

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EUDR: Is the food industry ready to prove its supply chains are deforestation-free?

The food industry has until 30 December 2024 to comply with the EU Deforestation Regulation (EUDR) for cocoa, coffee, soy, palm oil, beef, and their derivatives. Is this going to be doable? *Fi Global Insights* speaks to a sustainable supply chain expert at Solidaridad Network.

The new [EU Deforestation Regulation](#) provides a legislative framework for ensuring that certain commodities traded and consumed in the EU no longer contribute to deforestation. With just months to go before the regulation is enforced, the food industry's preparations should be well under way.

"I hope that affected companies are already actively working on meeting the EUDR requirements. If not, they should start right away," Gert van der Bijl, senior EU policy advisor with NGO [Solidaridad Network](#), told this publication.

From a food or ingredient manufacturer perspective, the starting point for ensuring compliance is to ascertain which of the products listed in Annex I of the regulation they are bringing into the EU, according to van der Bijl. As well as the commodities cocoa, coffee, soy, palm oil, and beef, the list includes derivatives of these products, such as cocoa beans, shells, husk, powder and butter, soybean flour, oil and meal, and glycerol, palmitic acid, stearic acid, and saturated acyclic monocarboxylic acids.

The key to compliance is supply chain knowledge

The formal responsibility for demonstrating compliance sits with the companies who place these products on the EU market or export them out of the EU – but that doesn't mean other supply chain members are absolved of responsibility.

In practice, the burden of proof that no deforestation has taken place is shifted onto the shoulders of producers and farmers at the source of supply, whilst brand owners and manufacturers have a vested interest in gathering evidence of the ethical practices increasingly being demanded by retailers, investors, and consumers.

In short, eliminating the products of deforestation from the food production system is a multi-stakeholder matter that requires supply chain cooperation and relies on downwards pressure.

Take, for example, a margarine that uses a palm oil derivative; the supplier that brought this ingredient onto the EU market will be responsible for EUDR compliance, but this will require intelligence from those further up the chain – farmers, cooperatives, and traders. Therefore, the key to ensuring products meet the requirements of the new legislation is supply chain knowledge.

“It is all about knowing your supply chains. Companies can only ensure their supply chains are deforestation free if they know where their coffee or cocoa is grown or where their beef has been grazing,” said van der Bijl.

Companies need to provide the geolocation of all plots of land where the relevant commodities were produced, as well as the date or time range of production. Where the area is more than four hectares in size, they need to supply polygons showing the boundaries.

Once operators have established where their products are coming from, the next step – and the core of the new regulation – is ensuring that they are not from land that has been deforested since 31 December 2020. This requires a due diligence system, explained van der Bijl.

“There are no predefined rules for how this due diligence system should look, but it should allow operators to ascertain that the risk of deforestation is close to zero or negligible,” he advised.

To this end, he said the Organisation for Economic Cooperation and Development (OECD) has developed support tools, such as guidance on deforestation and due diligence in agricultural supply chains.

“Ultimately though, it is up to each individual company to implement a system that shows that the risk is close to zero,” he added.

Solidaridad: ‘A considerable undertaking’ for some sectors

Van der Bijl said that meeting these demands was a “considerable undertaking” for sectors such as coffee, cocoa, and beef because, until recently, most companies buying these commodities did not know exactly where they were coming from. He added that in coffee supply chains this challenge is compounded by the number of middlemen involved.

“In some regions, such as Indonesia or Uganda, there are three or four middlemen between the farmer and the first point of processing, in which case the product becomes ‘anonymous’. This is no longer allowed; companies need to trace their products right back to source and cannot allow them to be mixed with unknown sources,” he said.

In this respect, he said the requirement for full traceability provides an incentive for companies to shorten their supply chains and deal directly with growers and cooperatives.

Cut out the middlemen and don't disregard small producers

“Cooperatives need to cut out these middlemen to ensure they have more direct relations with the farmers. This is the only way that they can definitively say what the origin of the coffee is and show that it is not coming from land that is recently deforested,” he said.

A less desirable consequence of the regulation might be that companies rationalise their supplier bases to work with fewer suppliers.

“This is a potential concern as if companies reduce the number of suppliers they work with, there is a risk they will elect to buy from larger suppliers rather than smallholders. It could threaten the livelihoods of smaller farmers who are less ‘organised’ or located in regions where the infrastructure is less developed,” warned van der Bijl.

Taking the coffee supply chain as an example, he said that 40% of the global supply comes from Brazil where farmers tend to be larger and better organised in terms of their readiness to meet EUDR requirements than in African countries.

“Some coffee companies have already indicated that they would have difficulty buying more coffee from countries like Tanzania, Ethiopia or Uganda, where they would be dealing with a large number of smallholders, and that it would be easier for them to buy coffee from Vietnam or Brazil,” said van der Bijl.



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The trouble with sourcing from a more concentrated supply base is that in the long term, it could result in tighter supplies, he explained: “Climate change is already reducing the amount of coffee produced in some origins. Therefore, it is in the interests of coffee companies to maintain broad supply chains that include African countries.”

To avoid this situation, Solidaridad is calling on companies and governments to invest in improvements to infrastructure to ensure farmers of all sizes can supply the required data.

Asked how ready stakeholders are for the new requirements, van der Bijl said he was sensing “some nervousness”.

“Across the different sectors and countries there is still an awful lot that needs to be done and it remains to be seen whether everything will be ready by the end of the year. A major factor is that the Commission is still to provide additional guidance on quite a few areas,” he said.

Awaiting guidance from the European Commission

One of the areas where guidance is outstanding is so called “country benchmarking”, whereby origin countries (and regions) are ranked according to the risk of the occurrence of deforestation. Products sourced from high-risk zones will be subject to additional due diligence requirements and scrutiny when imported into the EU.

Another area where the Commission has yet to provide guidance is on certification systems and the role they can play in demonstrating compliance, said van der Bijl.

“If a company buys Rainforest Alliance-certified coffee or Fair-trade cocoa, they still have to show they meet the requirements of the regulation. These certification schemes are not a ‘green light’ to compliance. The Commission therefore needs to clarify how companies can use these schemes within their own due diligence systems.”

The requirement for suppliers to demonstrate compliance with local laws on areas such as human rights and tax is a third area that is awaiting clarification.

“The Commission needs to provide guidance on exactly how this will be done and has asked countries to come up with lists of local laws that will apply here,” said van der Bijl.

But he emphasised that the industry needs to press on with its preparations rather than waiting for clarification on these points, as the drive towards sustainable, transparent supply chains is only going to intensify.

“Ultimately, this is about more than legal compliance; a sustainable future is what is really at stake. In order to operate sustainably, businesses need to know where their products come from and work with their suppliers to ensure they are produced in a responsible way.”



‘Business unusual’: Sustainable innovation in ingredient sourcing

From baobab powder to mountain hazelnuts, a collection of “business unusual” case studies illustrate the alternative approaches some companies are taking to make forest and food supply chains more sustainable.

A report published by the International Institute for Environment and Development (IIED) presents these case studies as exemplifying “business unusual” by embedding partnerships with smallholder producers into their core mission.

Through [the report](#), IIED demonstrates how biodiversity loss, climate change, and other environmental threats such as pollution and soil erosion threaten the “business as usual” model prevalent in the industry.

Embracing complexity in supply chain partnerships

A growing number of businesses sourcing their products from forest and farm landscapes are aspiring to be a force for societal good. As of February 2024, there are [over 8,000 certified B Corporations](#) worldwide, across 162 industries in 96 countries. These purpose-driven for-profit businesses are implementing innovative

ways to manage the complexities in their supply chains, thereby fostering sustainability and equitable growth. These businesses – and other social enterprises that are not officially B Corp certified – aim to create benefits for all stakeholders, not just shareholders, and are navigating social, environmental, and economic complexities in their supply chains to create positive impacts for local producers and the landscapes they depend on.

Case studies of pioneering companies

The companies that feature in the case studies invest heavily in building trust and shared goals with smallholder producers and leverage technology, such as mobile apps, to collect and aggregate necessary data without overburdening the producers.

Case study #1: Aduna

Aduna, based in London, is a social enterprise sourcing grains, powders, superfood teas, and beauty oils from Ghana and Burkina Faso. With an annual revenue of approximately \$3 million, Aduna works with over 3,300 women in these countries, supporting 20,000 family members. What makes Aduna's business model unusual is its deep commitment to social impact and environmental sustainability. The company has planted over 60,000 moringa trees and 15,000 baobab trees, creating a sustainable source of income for local communities while promoting biodiversity.

Case study #2: Mountain Hazelnuts

Mountain Hazelnuts operates in Bhutan, working closely with smallholder farmers to cultivate hazelnuts. The company provides extensive social and technical support to help producers reach their personal and communal aspirations. This includes assisting with agroecological farming techniques, promoting biodiversity and sustainable land management. Mountain Hazelnuts' approach goes beyond commercial transactions, building resilient farming communities through holistic support and sustainable practices.

Case study #3: Tony's Chocolonely

Tony's Chocolonely, a Dutch chocolate company with a mission to make all chocolate 100% slave-free, has established long-term partnerships with farmers' cooperatives. These partnerships support the cooperatives in developing stronger organisational capacities and diversifying and improving their land and businesses. What sets Tony's Chocolonely apart is its mission-driven focus on eradicating slavery and exploitation in the cocoa industry, ensuring fair treatment and improved livelihoods for farmers.

Case study #4: Cafédirect

UK-based Cafédirect sources coffee, tea, and cocoa from smallholder farmers in developing countries. The company invests significantly in nurturing partnerships along its supply chains, covering all operational costs for their local partners who provide flexible and direct support to smallholder producers and their cooperatives. Cafédirect's model is unique due to its deep investment in partnership development, prioritising long-term sustainability and mutual benefit over short-term profits. This approach ensures that producers are integral to the company's success and benefit directly from it.

Building trust and social capital

These pioneering companies challenge the traditional buyer-seller relationship in agriculture and forestry supply chains. They demonstrate that a partnership model is a viable business model that provides the flexibility and adaptability needed to deliver positive social and environmental impacts despite complex social, economic, and environmental contexts. The report by IIED makes it clear that successful "business unusual" companies are those that build strong, trust-based relationships with smallholder producers by providing comprehensive – social, technical, and financial – support. This includes training in sustainable practices, access to markets, and investment in local infrastructure.

Climate change threatening ingredient supply chains

The increasing threats posed by climate change and biodiversity loss to global food ingredient supply chains underscore the importance of adopting new business models. Extreme weather events, such as droughts, floods, and heatwaves, are causing significant disruptions in food production and distribution.

For instance, cocoa prices globally hit a record high in February 2024 due to dry weather in West Africa, exacerbated by the El Niño phenomenon. This led to a doubling of cocoa prices since early 2023, significantly impacting chocolate production costs.

Soybean production has also been heavily impacted, particularly in the US and Argentina. The Midwest experienced its worst drought since 2012, leading to a substantial drop in soybean production. Argentina faced similar issues, with drought conditions causing a significant decrease in soybean output, affecting both local and international markets.

Biodiversity loss further compounds these challenges, posing a serious threat to food security. The decline in biodiversity affects pollination, soil health, and the resilience of agricultural systems to pests and diseases. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has highlighted that around a million species face extinction, which would severely impact agricultural productivity and food security. The loss of biodiversity narrows the gene pool, making crops and livestock more vulnerable to climate change and other environmental stresses.

A journey from extractive fishing to regenerative ocean farming



Bren Smith, Co-Executive Director & Co-Founder, Greenwave

Fisherman-turned-ocean farmer Bren Smith founded Greenwave, a global network for regenerative ocean farming, after working through two ecological collapses. He shares the story of his “journey of ecological redemption” and explains how seaweed farming can help restore ocean biodiversity.

Growing up in a coastal community in Newfoundland, Canada, Bren Smith never expected he would become the executive director of a global regenerative farming network. “All our houses were painted red, green, and blue so we could find our way home in the fog when we were a bit drunk, and all I ever wanted to be was a fisherman,” he said. “They go out in the morning, they have self-directed lives, they succeed or fail on their own terms, and have this pride of feeding their country and community. These are the jobs we like to sing songs about – the coal workers, the farmers, the steel workers. These are soul-fulfilling jobs.”

Smith left high school when he was 14 and “headed out to sea”, fishing herring, lobster, tuna, and, lastly, cod and crab in the Bering Sea. He loved the sense of solidarity among his fellow fishermen and the humility of being surrounded by fifty-foot waves.

He said: “The trouble was, I was fishing at the height of industrialised fishing, so we were tearing up entire ecosystems with our trawls. I didn’t know it – I didn’t have the words then – but when you fish and you see seas of deaths around, you think, ‘There is no future in this. [...] But I want to die on my boat - that’s [my] metric of success!’”

On the front line of climate change

Smith said he has experienced the impact of climate change first-hand, working through two ecological collapses.

The first was due to the crash of cod stocks that put 30,000 people out of work “overnight”. Smith described how this decimated not just the fishing economy but entire communities that had thrived for hundreds of years. He said: “Fishermen were walking the streets like hungry ghosts – and I think there was the beginning of a change [...]”

When you see a culture collapse, you think, ‘Oh my god, there aren’t going to be any jobs on a dead ocean or a dead planet.’”

The second ecological collapse came when – after a brief stint working on salmon farms where he quickly grew disillusioned with high levels of pesticide and antibiotic use – Smith set up his own oyster farm. This farm was destroyed two years in a row by Hurricane Irene and Hurricane Sandy, and this set him on a path searching for “a new relationship to the seas”.

Regenerative ocean farming is ‘replicable and scalable’

Realising that he was “on the front line of climate change”, Smith decided to switch to a polyculture farming model where both seaweed and shellfish (scallops, oysters, mussels, and clams) are grown together.

“[You] ask the ocean, ‘What does it make sense to grow?’ and the ocean says: ‘Why don’t you grow things that don’t swim away and you don’t have to feed.’ One of the fastest-growing plants on earth is kelp and I was able to use a vertical, scaffolding system to grow seaweed,” he said.

Regenerative ocean farming is a food production model that makes sense from an environmental perspective – seaweed restores habitats, promotes biodiversity, sequesters carbon, and removes excess nitrogen – but, importantly, it also makes sense from a farmer’s perspective, Smith explained.

He said: “It requires zero inputs. No fresh water, no fertiliser, no feed – everything we grow uses the sunlight and nutrients [in the water] – so there are very low overheads. The business model becomes simpler and, as the price of food on land goes up because of fresh water [constraints], and so on, ours actually remains constant. It’s also replicable. With 20 to 50,000 dollars you can start a farm – it’s just ropes and buoys – [...] but it is also scalable.”

In terms of commercialisation, kelp and other macroalgae can be used for food and animal feed and as an alternative to plastic and artificial fertiliser. Research has shown that fermented seaweeds can help soil become more resistant to abiotic stress such as drought and heat, Smith said.

Greenwave: Working to create a blue economy

Today, home for Smith is Long Island Sound, a tidal estuary between Connecticut and New York’s Long Island where his Thimble Island Ocean Farm is located. Around 10 years ago, he also created the non-profit

Greenwave with co-founder Emily Stengel to spread knowledge about the methods used for regenerative ocean farming. What started out as him informally training his fishermen friends who found themselves out of work – “the lobsters disappeared, gillnets were just coming up empty” – quickly turned into a programme that now has a waiting list of over 8,000 people around the world.

Greenwave has a multi-pronged approach to supporting ocean farmers. Its online Ocean Farming Hub provides a toolkit and knowledge network to help people plan, apply for permits, and launch their own farms, aided by its MyKelp app.

It also has a community hub where people can collaborate to scale their farms, while the Seaweed Source is a marketplace where farmers can find distributors to sell their products.

Its farmer-owned seedbank shares plant resources (thus resisting privatisation) and a commercial farm and hatchery act as its innovation hub where it develops and tests new technologies.

Greenwave also offers a subsidy programme – the Kelp Climate Fund – that recognises farmers for the climate-positive role of their ocean farms by giving them direct payments in return for data on their planting, growth rates, and yields.

Breathing life back into the ocean

Smith is careful to not present this as a magic bullet – it is just one piece of the climate solution puzzle, he said – but he is also confident that with time and investment, regenerative ocean farming can form the backbone of thriving economies, communities, and cultural identities just as fishing has done for generations – all while restoring the environment.

“It breathes life into the ocean but it’s also good for us [who] want to die on our boats,” he said. “I don’t know who is going to write the first kelp sea shanty but I’m waiting! Because we are proud of this. It’s where we want to go.”



MicroTerra's lemna-derived ingredient combines sustainability with versatility



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MicroTerra wants to change the food industry using lemna, an aquatic plant. Its new ingredient, Flora, is currently marketed as a sweetener enhancer but has other potential applications such as improving flavour and mouthfeel.

Marissa Cuevas Flores is the founder and CEO of MicroTerra, a Mexican biotech startup currently pioneering sustainable food ingredients by harnessing the cleansing power of lemna, also known as duckweed, a free-floating aquatic plant. By simply cultivating lemna, farmers contribute to cleaning up the water supplies.

Lemna offers farmers a lower-risk and more sustainable solution

MicroTerra's business model initially focused on microalgae, before moving to lemna. "I started my journey when I realised that agricultural runoff is the biggest water pollutant, and there is no commercial water treatment for it. We were [initially] using microalgae to absorb nutrients and create

biomass," Flores told *Fi Global Insights*. However, the high capital expenditure and low product yield made it challenging to attract investment. In addition, Flores and her team faced hurdles in convincing farmers to embrace the microalgae technology.

Covid-19 provided an unexpected opportunity for MicroTerra. "If Covid hadn't happened, we might still be pursuing the less viable microalgae approach," Flores explained. The pandemic forced the team to pause and re-evaluate its approach, Flores added, leading to hundreds of industry expert and stakeholder interviews. This process highlighted to Flores the need for a more viable solution that farmers could adopt without high risk. The pivot to lemna, a simpler and more resilient plant, offered a sustainable solution that farmers could implement with lower risk and investment.

Helping farmers turn wastewater into a profitable resource

Unlike microalgae, lemna does not require sophisticated equipment or highly technical skills to cultivate, making it more accessible for farmers. It grows rapidly, even in nutrient-rich wastewater, and can be harvested easily. Lemna's high protein and nutrient content – up to 45% crude protein alongside phytonutrients, dietary fibres, and vitamin B12 – also make it a valuable product for the food industry.

Flores recognised that by helping farmers turn wastewater into a profitable resource, they could create a sustainable and scalable business model that reduces both water and greenhouse gas pollution. “We needed something different to clean the water, and lemna turned out to be a perfect fit,” Flores said. “Lemna is simpler, can be seen with the naked eye, and reproduces easily,” she added.

Flora: MicroTerra's versatile and sustainable sweetener enhancer ingredient

Flora, MicroTerra's sweetener enhancer ingredient derived from lemna, launched in February of 2024. The ingredient offers multiple benefits as a food ingredient and is currently marketed as a sweetener enhancer to be added to food and beverage products with reduced sugar content like ice cream or sweet beverages.

But MicroTerra has plans beyond this. “Flora has a lot of properties; it's a sweetener enhancer, a flavour enhancer, and it improves mouthfeel,” Flores said. In addition, MicroTerra is in the process of ongoing research to identify specific molecules responsible for these effects, with the potential to create targeted flavour enhancers.

“We have found molecules responsible for buttery flavour, which can significantly change the taste profile of foods,” she added.

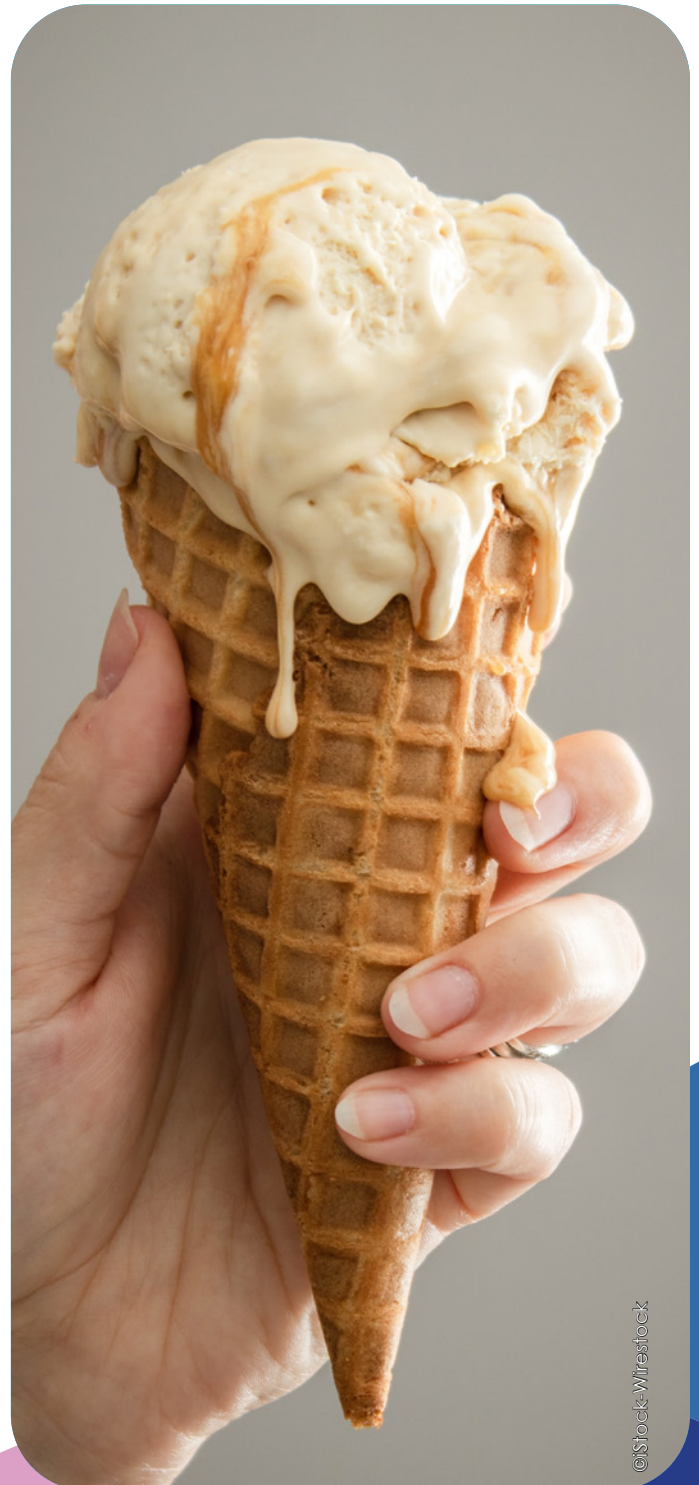
Flora's versatility makes it a valuable addition to the plant-based food industry, Flores explained, such as addressing key challenges related to taste and texture. “In the future, we may develop more specialised ingredients like a buttery enhancer or a citrus enhancer,” Flores added.

Flora is approved in Mexico, with plans to enter the US and EU market

“MicroTerra is actively working on regulatory approvals for Flora to expand its market reach. “We are already approved by [Mexico's regulatory health authority] COFEPRIS in Mexico and are working on our GRAS [Generally Recognised As Safe] proposal for the US,” Flores said.

MicroTerra is also looking towards Europe: “We see Europe as leading the way in plant-based food, and we are exploring how to enter that market.”

The company aims to focus on the intellectual property and licensing of Flora, including partnering with larger corporations to scale its impact more rapidly. By licensing its technology, MicroTerra can enable other companies to incorporate lemna into their products, driving wider adoption and contributing to global food sustainability.



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The Big Food Redesign Challenge: Designing circularity into food products



The Ellen MacArthur Foundation has identified four design strategies that brands can use to create sustainable products that regenerate nature and, through its Big Food Redesign Challenge, threw down the gauntlet to the industry: create delicious products that don't cost the earth.

Last year, the Ellen MacArthur Foundation (EMF) partnered with the Sustainable Food Trust to launch [the Big Food Redesign Challenge](#), a competition aimed at catalysing and inspiring the food industry to build a better food system that regenerates nature, based on the principles of a circular economy.

To guide product developers, it created the Circular Design for Food Framework, based on findings from EMF's 2021 study, [The Big Food Redesign: Regenerating Nature with the Circular Economy](#).

The framework identifies four upstream design opportunities that manufacturers can leverage to develop products that actively contribute to regenerating nature.

Four circular design strategies to regenerate nature

Reniera O'Donnell, food initiative lead at EMF, outlined the four strategies and shared examples of products that successfully met the Challenge criteria. The first opportunity to seize is sourcing all ingredients from regenerative production systems. EMF defines these as systems that lead to better soil health, better biodiversity, clean air, and clean water (although it acknowledges that many other parameters could be taken into account). While the result of these practices varies from farm to farm, crop to crop, and geography to geography, ultimately the outcome is the same, O'Donnell said: "Nature is better as a result of these practices."

The second design strategy relates to diversity of ingredients and variants. While shoppers in a supermarket may feel the food industry provides an abundance of diverse foods, this perceived diversity of choice is often an illusion: just 30 crops supply 95% of people's calories, and four crops – corn, rice, wheat, and potatoes – supply over 60%, according to the Food and Agriculture Organization's (FAO) Commission on Genetic Resources.

Product developers can increase biodiversity and dietary diversity through their sourcing strategies. "Instead of using the Cavendish banana, which is the regular banana we all see in supermarkets, maybe you design a smoothie using the Indian apple banana, which is smaller and more flavoursome," said O'Donnell. "By doing this, you signal to banana growers that there is a market for them to plant and grow banana varieties that are more suited to their local context, that are more resilient, and therefore that require less artificial inputs. That is exactly what Kencko did when they designed their purple smoothie."

The third design opportunity is to use lower-impact ingredients. "There is lots of debate about the role of livestock in the food system, and there is no doubt that moving away from using animal proteins to more plant proteins is going to have a significant effect on GHGs [greenhouse gases]."

But livestock also play a really crucial role in a regenerative farming system through their natural fertilisation and tilling capabilities. So lower impact doesn't just refer to moving from animal to plant proteins but also about the kinds of crops you are using," O'Donnell said.

An example of a lower-impact ingredient swap could be using pulse flour, such as pea flour, instead of wheat flour. UK company Brave Cereals opted for this strategy for its grain-free breakfast cereals, using a high-protein and high-fibre blend of pea protein, chickpea flour, pea fibre, and chicory fibre.

She said: "This signals to farmers they can intercrop with wheat legumes [...], which locks in nitrogen, again leading to less artificial inputs that clog up our waterways and ruin our soils."

The fourth design strategy is upcycling. "Keeping products or materials in use – or nutrients in the case of foods – is another key principle of the circular economy," said O'Donnell. EMF modelling, for instance, showed that if sugars were made using the upcycled sucrose and cellulose in on-farm crop residues, a mere 1.5% of crop residues would be required to meet the global demand for glucose syrup and an area the size of Luxembourg would not need to be farmed.

Product	Conventional	Plant-based	Up to 92% reduction
Conventional beef	17% reduction	52% reduction	Up to 92% reduction
Conventional pork	63% reduction	72% reduction	Up to 95% reduction

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Circular products: Pancake mixes, chocolate, burgers, ready meals, and more

While creating frameworks based on theoretical modelling is all well and good, O'Donnell said, the real challenge was proving that it actually works for product designers. This is what spurred EMF to launch the Big Food Redesign Challenge.

A total of 166 products from 71 companies and 15 countries successfully met the challenge criteria – that a majority of their constituent ingredients came from regenerative agriculture systems; that they included at least one other sustainable design strategy; and that their packaging was on a journey to circularity – and they spanned many different food and drink categories. For a full list of the participants [click here](#).

What struck O'Donnell was that the products “look[ed] exactly like the kinds of things we buy today only with intentional, nature-enhancing design decisions built into those food products”.

Examples included Creative Nature's organic pancake mix made with regeneratively sourced fava bean flour, packed in a plastic-free packaging that dissolves when added to the pancake batter.

Another product was a burger patty that replaced 25% of the beef with seaweed – thus reducing the impact of GHG emissions from the cattle used to produce the beef and contributing to regenerating ocean biodiversity – while UK-based Stoked Foods entered its range of plant-based ready meals.

A Latin American brand, Nutricandies, made confectionery with cocoa grown in agro-forestry systems and ingredients that were upcycled from cocoa processing waste streams, while in the drinks category, the Amalthea gin brand proposed a dry gin whose base spirit is made with apples sourced from heritage apple farmers instead of grains.

From design to production to retail

The Challenge is currently in the production phase – brands are starting to manufacture their products – and the next phase will focus on working with retailers to bring the products to consumers. These phases aim to trial the products and learn what works as well as identify what policy changes are needed to enable a circular food system.

“... Retailers are quickly realising that they have a crucial role to play in supporting a more regenerative food system. In the UK, Waitrose and Fortnum & Mason have committed to stocking a selection of these successful products on their shelves for six months from early 2025, bringing them to consumers, and in Latin America, Carrefour Brazil are doing the same,” O'Donnell said.

The long-term aim is to transform the food industry's impact on the environment. According to EMF research, the top 10 FMCG manufacturers and retailers across the EU and UK have influence over about 40% of agricultural land in those regions.

“At the moment, that influence is not giving us healthy landscapes or healthy soils – but equally, it could,” O'Donnell said. “And [manufacturers and retailers] could redesign their product portfolios putting what landscapes need at the heart of those decisions. The products of the Big Food Redesign Challenge have categorically shown that it is possible.”



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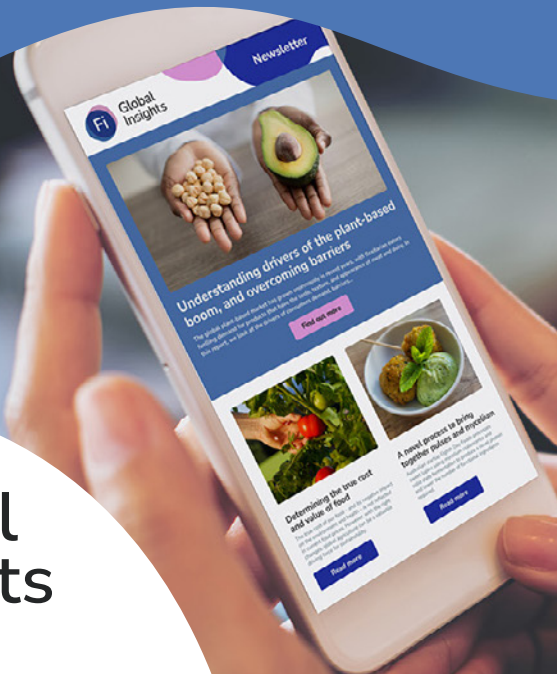
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How sustainable brands can win back sceptical consumers

Embracing sustainability at a time of rising consumer scepticism and declining discretionary spending requires active measures and bold communication to rebuild consumer trust.

Increasing awareness of greenwashing has led to a growing discontent with unsustainable practices. At the same time, more and more people are unwilling or unable to pay a premium for products that have a lower social or environmental impact. This paradox is at the heart of the new reality facing sustainable brands in the food and beverage industry.

Linda Lichtmess, a research consultant at Euromonitor International, and Chhavi Jatwani, director of research and innovation at the Food for Climate League, discussed effective strategies to build sustainable brands during an [Fi Webinar Series](#) discussion.

Consumer perceptions and challenges

Consumer perceptions of sustainability have fluctuated, with a notable decline in 2024, driven in large part by economic challenges and fatigue with vague or misleading sustainability claims. Euromonitor data

showed that amidst this “eco exhaustion”, 64% of consumers claimed they were trying to have a positive impact on the environment with their spending, but only 45% felt they were actually personally contributing.

Lichtmess noted: “Greenwashing and multiple crises have shifted consumer priorities, but sustainability remains a norm, especially for younger generations.” She emphasised that sustainability as a standard practice is increasingly becoming an expectation among the Millennial and Gen Z demographics.

Lichtmess shared data from Euromonitor indicating that over 40% of consumers see price as the main barrier to purchasing sustainable products. However, younger generations are more willing to invest in sustainability, linking food choices to mental and emotional well-being. “Addressing mental health through sustainable food choices can be a unique selling point,” she suggested.

And while sustainable practices are often perceived as expensive, Jatwani argued that this is not necessarily the case from a broader societal and ecological perspective. She said: “The supposed savings in conventional practices result in hidden costs elsewhere, such as health and environmental damage.” True cost accounting reveals these hidden costs and highlights the long-term benefits of sustainability.

Measuring impact

With the need to earn back consumer trust as a top priority, brands need to more accurately measure and communicate sustainable impact. This requires high-quality data across the supply chain.

According to Chhavi, generic life cycle assessments (LCA) are insufficient. “Assessments must be specific to the ingredient and supply chain, considering factors like land use change and water usage,” she explained.

Transparency and scientifically backed claims are also crucial for (re)building consumer trust in sustainable brands. To do so, companies have to turn to new channels to communicate their commitments. Lichtmess noted that “the main sources of trust are family and friends, followed by social media influencers”. Effective communication strategies therefore have to involve partnering with influencers who can convey sustainability messages accurately and engagingly.

Chhavi underscored the role of social media and micro-influencers in reaching consumers. “Investing in influencer networks ensures sustainability messages are communicated in relatable ways,” she advised. Simplifying complex sustainability information through visual tools and user-friendly platforms can enhance consumer understanding and engagement.



Smaller brands leading the way

According to Lichtmess, the companies at the forefront with the best practices in the industry tend to be startups or smaller brands. She cited plant-based milk company Oatly as a leading example of breaking through and mainstreaming a more sustainable alternative. “Communicating sustainability pledges clearly and making sustainability mainstream is essential,” she said.

Jatwani, who has extensive experience in food systems innovation, identified two main clusters of sustainability: environmental and socio-economic. Noting that the environmental and ecological systems are deeply interconnected, she stressed the importance of starting with soil health and using regenerative ingredients. “Patagonia is a great example of a brand using regenerative ingredients,” she said. “Using tools like PlanetForward for life cycle assessments can help other brands identify the most impactful areas,” she continued.

The future of sustainability

The popularity of sustainable ingredients like kelp and spirulina is on the rise. Jatwani highlighted the increasing interest in sea vegetables, driven by their nutritional benefits and potential for innovative uses. “The [Blue Foods Assessment Report](#) and initiatives like COP28 are bringing more attention to aquatic food sources,” she said. However, regional differences in production costs mean that US-grown sea vegetables will remain niche, likely limiting widespread adoption in that market in the near term.

With stronger regulatory regimes expected on the horizon – particularly in the EU because of the [new CSDDD framework](#) – navigating regulatory change is becoming an ever more significant challenge for food and beverage brands.

Lichtmess emphasised the importance of staying ahead of regulatory frameworks to ensure long-term sustainability. “Proactive measures and partnerships with external assessors can help companies manage their supply chains more effectively,” she noted. Some retailers have already taken proactive steps by assessing product sustainability to stay ahead of regulations – and to earn consumer trust. As regulations become more stringent, brands that adopt sustainable practices early will be better positioned for future success.



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Could a beer-brewing byproduct feed the growing population?

Researchers from Singapore have been able to extract 80% of the available protein in brewers' spent grain, a beer-brewing byproduct. They say their method could help reduce waste, be directly used in supplements, and enhance the protein content of plant-based foods.

The world's population is expected to grow by more than 40% by 2050. Sustainably feeding the growing world is going to be a global effort, one that is no easy feat. [According to research from Wageningen University](#), we need to change both our consumption behaviour and our means of food production. Food waste should be minimised and a large proportion of our diet should come from plant-based products.

While the importance of protein in the diet is well-established, ensuring that the expected world population of 10 billion in 2050 has access to adequate amounts of protein, sourced sustainably, means looking further afield and beyond conventional meat.

Researchers from Singapore's Nanyang Technological University (NTU) may have come up with a method to help address this dilemma by extracting edible protein from brewers' spent grain, a byproduct of brewing beer. Their findings were [published in the *Innovative Food Science and Emerging Technologies* journal](#).

Lead author of the study and director of NTU's Food Science and Technology programme, William Chen, said: "Our method presents an innovative way to repurpose beer waste into a valuable protein source for global nutrition."

Protein successfully extracted from brewers' spent grain

The researchers developed a sustainable method of extracting protein from brewers' spent grain. In doing so, they were able to extract 80% of the available protein, up to 200 g of protein per kilogram of brewers' spent grain. Globally, approximately 36.4 million tonnes of brewers' spent grain are produced yearly. If 200 g of protein per kilo were to be extracted from this waste, it would amount to approximately 7.8 billion kilos of protein.

Before extracting the protein, the team used *hizopus oligosporus*, a food-grade fungus, to sterilise the brewers' spent grain. Next, a three-day fermentation process took place, which assisted in breaking down brewers' spent grain's structure and making the protein easily extractable. The fermented brewers' spent grain was then dried, before being ground into a powder, sieved, and spun in a centrifuge. The protein separated from the rest of the mixture in the centrifuge and floated to the top where it was extracted and was ready to be used.

"Our study, which presents more sustainable and efficient ways to add value to brewers' spent grain disposal, is a crucial step towards mitigating its contribution to greenhouse emissions and reducing environmental strain, while also enriching the global food supply chain," said Chen. "Demonstrating that the protein-rich qualities of brewers' spent grain could be successfully extracted and funnelled into supplements and enriching plant-based proteins to make them more attractive to the consumer addresses two global pressure points – food wastage and food shortage."

Upcycled protein isolate could appeal to consumer demand for sustainable options

Consumers want sustainable options when it comes to food. According to the World Economic Forum (WEF), in 2023 around 65% of consumers wanted to make the right spending choices to live a more sustainable and healthier life. When it comes to the food industry, WEF suggested that food producers can appeal to evolving consumer appetites while looking after the planet, through a wider product range of sustainable goods.

Brewers' spent grain contains around 19-30% crude protein, making it an ideal raw material for protein isolate production. One study compared the nutritional and functional characteristics of brewers' spent grain protein isolate, with commercially available pea and soy protein isolates. In terms of nutrition, the researchers found that the spent grain isolate met or exceeded the requirements of each essential amino acid per g protein, except for lysine.

Similar protein contents were found across the three protein isolates, but the spent grain isolate exceeded the pea and soy versions in terms of protein solubility, which in turn affected other functional products of the spent grain isolate. It also exhibited high solubility, foaming capacity, and minimal gelation properties. The researchers concluded that their findings indicated spent grain isolate's potential as a new, sustainable plant-based protein source for human nutrition, particularly for dairy alternative applications.



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