

# FEATURE

Observations from the IFEAT Online Conference 2021 and the BSP/SCS event Fragrance and Sustainability with LMR/IFF

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## What is sustainability and what does it look like in the Aroma Trades?

In simple terms, sustainability is living without having a detrimental effect on the environment and those who inhabit it, human, animal or plant. This is such a straightforward concept but putting it into practice is incredibly complex as soon as you delve into it, taking into account green issues, sociological aspects as well as economic factors including the all important bottom line.

The aroma trades encompasses a mixture of ingredients both naturals and synthetics (many of which are derived from natural products). These natural resources are obtained either from wild harvesting or agriculture in a global supply chain that is probably one of the most complex in any industry, incorporating numerous business-to-business transactions. These means there are not many situations where it is obvious who should be taking responsibility for which sustainability goals and footing the bill for costs incurred in doing so.

In order to examine the complexity of the situation, it's vital to understand the full flavour and fragrance value chain.

### Plants

These form the basis of most aroma chemicals (natural and synthetic) and it's important to understand the journey from plant to aroma material.

- Some are wild harvested, since farming is not possible. Key issues here are whether the plant is endangered or part of a vulnerable ecosystem and how companies can trace the source of the plant and guarantee that harvesting it has not caused unsustainable damage to the environment.

- Most are farmed. Here the farming methods are under scrutiny including the effects on soil health, the use of agrochemicals (pesticides and fertilisers), general impact on the local ecosystem from deforestation, eutrophication and species diversity (particularly if large monocultures are the adopted approach) as well as harvesting strategies and any fuel used across the farming of the crop. Also under the spotlight are the welfare and working conditions of farm workers, including gender equality and child labour. Traceability is another cornerstone of any sustainability policy so any crop should be able to be tracked from planting to harvest.

### Purchasing, initial processing

Here the questions are focused on who buys the produce and its initial processing.

- Initial processing in the local area - many crops need to be steam-distilled very quickly after harvest to avoid deterioration and this is often undertaken near to farms in traditional steam distillation units. The fuel used for distillation, environmental pollution and the time taken are all key questions to assess sustainability
- Initial transportation from growing area - some crops can be transported to a more central area for initial distillation or other process. How far this is from the growing area and the method of transportation and fuels used would have an impact on its sustainability



- Initial transactions - a key aspect to the sustainability agenda is fair wages for the farmer. In numerous aroma products, the farmer deals with middle men (sometimes there are a number of these) so does the farmer get a fair price or not with each of these needing to make a profit? In some areas of the world, there are cartels and corruption while in other regions, cooperatives and collectives have been set up.

### Chemical processing to produce essential oils, absolutes and synthetic flavour and fragrance chemicals

- Transport of raw or semi-processed materials to manufacturing sites (proximity, fuels etc.)
- Chemical processing - how many green strategies are utilised (solvents, fuels, closed systems, greener engineering solutions etc.)? What about emissions and the carbon footprint, pollution, water and power usage?
- Welfare and wages of workers

### Creative perfumery house/compounder

- Transportation and fuel usage
- Chemical processing, substitution, adaptation of formulation to fit budget and regulations
- Welfare and wages of workers

### Transport to makers of end products such as cosmetics, food stuffs, homecare etc.

- Proximity & transport methods
- Wages and welfare of workers

### Manufacture of end products

Very similar concerns to those mentioned above, with the addition of: -



Copaiba tree in Brazil. Locations often kept secret.



- Packaging - use of non-recyclable items and one-shot plastics
- Marketing material

When you examine the complexity of the transactions, it is immediately apparent how challenging it is to track end products back to their origins due to the numerous business-to-business transactions in the process. It is very rare for the same company to be involved in the growing and harvesting end of things and also making aroma chemicals and end products. Where this is the case (as can be seen in LMR/IFF's Do More Good Plan) great progress can be made. However, in some of the industry, there is a good deal of secrecy to protect business concerns and there is the huge issue of a large number of farmers with small plots who are sometimes illiterate and/or do not have the resources to invest in the technology necessary for sustainable agriculture. At the last IFEAT online Conference in November there were a number of discussion panels that shed light on how achievable true sustainability in the flavour and fragrance industry actually is. It was clear from the outset that for some crops in some growing regions, it was far easier whereas in others there were serious challenges, some of which were seemingly insurmountable without a significant investment leading to a massive price hike for buyers/manufacturers and ultimately consumers. Consumers are also increasingly demanding in their buying decisions, wanting a truly sustainable product but not necessarily willing or able to pay the price, such modifications to agriculture and processing would necessitate.

Several key ingredients are wild-sourced as it's impossible to cultivate them. Eduardo Mattoso (General Director of Kaapi Ingredients, Brazil), who specialise in several wild-harvested materials stressed the secrecy that surrounds those who gather naturals like copaiba resin. The collectors are sometimes very reluctant to reveal where their lucrative gathering areas are within the forests. Some progress has been made with paperwork for products like tonka beans but they are also dealing with middle men who don't want to lose business and they can exert significant pressure to protect their business interests. Even with farmed products there is often a challenge: Mima Jacarandas (Development Department Director, Jacarandas International, Madagascar) explained the difficulty in her locality where there is only 40% literacy. Training farmers and her staff alongside investing in the necessary hardware and software would represent a substantial financial challenge for her company. In an industry where margins are often small, it is hard to see where this additional funding would come from.

Other aspects of sustainable agriculture require significant re-education in local communities and also substantial investment in new technologies, processes and entire agricultural approaches. Soil conservation, health and integrity, deforestation and the use of pesticides and fertilisers are key environmental concerns for the consumer. There have been some excellent initiatives reported in previous ICATS newsletters where larger companies have invested in sustainable farming techniques

and research into GM and hydroponic systems have been environmental trailblazers. However, for a large number of farmers there are two typical scenarios: either large-scale monocultures with heavy use of pesticides, fertiliser and irrigation or incredibly small-scale agriculture with often poverty-stricken farmers using outdated equipment whilst also using chemicals with little/no education in sustainability or regulation on safety. The pharmaceutical companies providing pesticides and fertilisers have huge budgets to offer incentives to farmers and are very unlikely to highlight any potential environmental impacts and safety issues in the usage of their products. Thus eutrophication has been an increasingly problematic issue with fertiliser-rich run-offs from agricultural areas into the wild and causing drastic changes in ecosystems.

These issues all present themselves before we even get to the manufacturing and transport and the inevitable environmental cost associated with these. Please see the article on the BSF lecture from Professor Giancarlo Cravotto of Turin University on green ideas for f & f manufacturing: there are numerous excellent recommendations for good practice there in processing and extraction. However, all-too-often ideal good practice doesn't always translate into reality. In an industry with often numerous middle men and business-to-business transactions, the ultimate question is who foots the bill for such modifications in processes? In such a complex supply chain with so many people wishing to see profits, margins are often already vanishingly small

with many smaller/medium companies unable to invest in new equipment and processes. LMR/IFF were very excited to share their new green solvent extraction using a substance usually present in fruit (cassava, sugar cane and sweet potato waste products) to create absolutes such as with a new olfactive signature such as narcissus and blackcurrant bud. However, it was pointed out that the green alternative cannot do everything that solvents like dichloromethane can which is why the olfactive qualities were different; however, the new absolutes have interesting novel antioxidant properties which are not present in synthetics.

Another key issue for consumers is also the health, education and welfare of workers with schemes like Fairtrade increasingly influential on buying behaviour. With narrow profit margins across the value chain and a reliance on numerous workers in the developing world that is often difficult to monitor, how would it be possible for the F&F industry to manage this complex issue and who would fund the necessary increase in wages and better living conditions? It remains a complex situation as those in the best position to fund philanthropic enterprise are not always in direct contact with the poorest workers in the value chain due the numerous B2B transactions in a complex supply chain. In a recent BSP presentation, LMR/IFF talked about various initiatives where they are tackling this issue. In Egypt, they are supporting women to get equity in income and also funding education in first aid and nutrition for families whereas in Haiti, they are not only supporting education, they are also funding disaster relief. In general terms across IFF, they have implemented policies to aim for an injury-free workplace, no bias for gender, disability, people of colour, LGBTQ (aiming for 50% female management by 2030) and also ensuring sourcing was responsible for human rights, animal welfare and equitable and supportive value chains. It was heartening to see some steps being taken in specific regions and it looks a good model for others to follow. However, this set up only works if a company is large enough to manage everything from field to processing and would be far more challenging with for example, some of the South American commodities such

as tonka that might be wild harvested and/or travel through numerous middle men or 'coyotes' before being purchased by larger companies who might actually have the resources to fund worker investments.

The LMR/IFF talk also discussed carbon neutral production with a pledge that they would be a completely carbon neutral company by 2040 and climate positive by 2050. This does seem to be some distance away but this fact highlights the difficulties for an industry that has a huge reliance on fossil fuels for distillation plants and transportation, solvents for extraction and numerous growing and production areas in the developing world. However, as was highlighted in a recent BSF talk (writeup in this newsletter) there are ways in which the processing of naturals and synthetics can be done more quickly in a more energy efficient manner using greener technology. As the climate agreements kick in and there is a swing towards electric transportation solutions away from diesel, there does appear to be some hope on the horizon.

When we consider finished products, there has been some progress in environmental schemes with many more consumers using refill stations, choosing recyclable packaging, trying to move away from one shot plastics as well as choosing 'environmentally friendly' brands that apparently don't contain chemicals that would harm ecosystems when disposed of or washed into seas, lakes and rivers. Nevertheless, there is always a balance to be made between packaging that is appealing to a consumer, inducing a purchase, and the best thing for the environment. I know from my own experience researching personal care and household products that it's incredibly hard to make a truly informed choice as a consumer. We refill where possible, use soap in cardboard or compostable packaging instead of handwash and shower gels and purchase eco-friendly laundry and homecare products but does this really go far enough? Even compostable and cardboard packaging has a manufacturing carbon emission (often larger than the carbon footprint for manufacturing plastic items) and the refill station has a giant plastic container made of the same material we are actively told to avoid. Is it time to go back to paper, wood/cork,



A possible revival for glass milk bottles

glass, metal and pottery packaging that would have been used in the days prior to plastic and would this in fact be more environmentally friendly once we take the manufacturing of these items into account? The rise of Milk and More in the UK, a company that provide 'old school' milk delivered to your doorstep in glass bottles along with a wealth of other items that are packaged in a sustainable way, shows that some consumers are happy to pay extra for an environmentally friendly option. However, this can surely not be the case across all market sectors, particularly as the cost implications, particularly for small producers/manufacturers would be huge. What then should we do? It is an even more complex situation as the other issue to take into account is safety and shelf life. Would manufacturers be able to ensure decent shelf-life and limit oxidation and other deterioration of volatile f&f chemicals if plastic-sealed packaging were not used and would consumers and retailers accept a shorter shelf life if this was the pay-off?

I seem to have ended with more questions than answers but it is heartening to know that there are numerous engineers, sociologists, chemists and responsible businesses working to improve matters for us and the planet. What is clear is that things as they are cannot go on and something needs to be done. Whether we are in time or too late for workable solutions remains to be seen but I am hopeful the species of homo sapiens will live up to their name and find intelligent, workable solutions since it really is in everyone's interest that we do!

IFF LMR Do More Good Plan  
<https://www.iff.com/responsibilities/strategy-reporting>