

Bioleather Report



The state of the industry today

Textile production has begun to take measures to stop being one of the most polluting industries.

One of the most important industries on the planet is undoubtedly the textile industry, involving not only the clothing, leather goods and footwear industry, but also interior design and the automotive industry with regard to passenger seats. It is almost impossible to imagine an environment without textiles.

Due to their volume and the type of developments, materials and processes used up to now, these industries have become the second or third -depending on the sources consulted- the most polluting on the planet.

And within this category is also involved the industry of animal leather and plastic leather or badly called eco-leather or ecological leather.

Textile, leather, and plastic leather production systems today operate in an almost completely linear fashion, using large amounts of non-renewable energy and emitting all kinds of toxic products into the environment.

Resources are mined to produce clothing that is often worn for only a short time, after which most materials are sent to landfills or incinerated.

73% of the clothing that is discarded in less

It is estimated that more than half of the fast fashion produced is eliminated in less than a year.

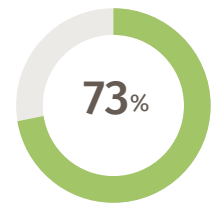
than a year ends up in open dumps or is incinerated.

In addition, this take-and-dispose model has numerous negative environmental and social impacts.

Hazardous substances affect the health of textile workers and clothing users, and escape into the environment.

Less than 1% of the material used to produce clothing is recycled into new clothing. Industry-wide, only 13% of total material input is recycled in some way after clothing wear.

When washed, some clothes shed plastic microfibers, of which about half a million tons each year contribute to ocean pollution. The trends point to these negative aspects. It is estimated that more than half of the fast fashion produced is eliminated in less than a year. This linear system leaves economic opportunities untapped, puts pressure on resources, pollutes and degrades the natural environment and its ecosystems, and creates negative social impacts significant on local, regional and global scales.



of the clothing that is discarded in less than a year ends up in open dumps or is incinerated.

Only **13%** of total material input is recycled in some way after clothing wear, industry-wide.

Textile production (including cotton cultivation) also uses about 93 billion cubic metres of water annually, contributing to problems in some water-scarce regions. With its low utilisation rates (mains at high throughput levels) and low recycling levels, the current waste of the linear system is the root cause of this massive and ever-expanding pressure on resources. The immense footprint of the industry extends beyond the use of raw materials. In 2015, greenhouse gas (GHG) emissions from textile production amounted to 1.2 billion tons of CO2 equivalent to all international flights and shipping combined. The industry also has direct local impacts. The use of substances of concern in textile production has negative effects on farmers, factory workers, and the surrounding environment, 20% of industrial water pollution worldwide is attributable to the dyeing and treatment of textiles, mainly of tanneries.

If we think specifically of the animal leather industry, considering cattle ranching as one of the main emitters of CO2 and methane in the atmosphere, the number of hectares needed to feed these cattle based on monocultures, normally non-rotating crops such as soybeans causes, on the one hand, the growing deforestation of native forests and, on the other, the impoverishment of the same cultivated lands that, by not rotating with other crops, become impoverished growing more and more. After a few years they need to cover more land, leaving the already mono-cultivated impoverished and desertified.

On the other hand, the tanning industry itself generates significant environmental

pollution problems, due to the use of toxic chemical agents such as chromium, ammonia and sulphides that contaminate the waters where these wastes are dumped. Fats and other meat material attract insects and rodents that spread infectious and contagious diseases.

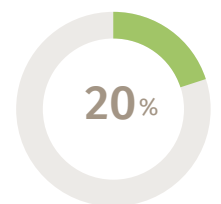
For their part, what are incorrectly called “ecological leathers or eco-leathers” are themselves plastics derived from petroleum, most of them PVC or PU, in both cases polyvinyl chloride. Beyond the polluting chemical processes for their manufacture, at the end of their useful life they will form part of the gigantic mass of plastics that pollute our oceans.

The impacts are inexorably increasing, with the potential for catastrophic results in the future. This linear system is ripe for disruption.

The figures presented in this report were provided by the Ellen McArthur Foundation.

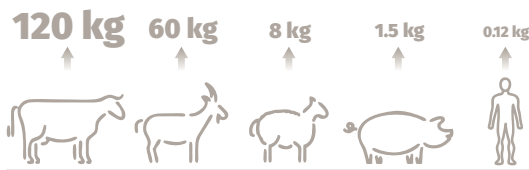


93 billion
cubic metres of water per year
used textile production



of industrial water pollution worldwide is attributable to the dyeing and treatment of textiles, mainly from tanneries

Annual methane emissions per animal



Source: Goddard Institute for Space Science (NASA)

Cattle breeding figures: soybean plantation for cattle feed



5 million

hectares of Argentine native forests felled in 16 years (1998-2014):

- Deforestation/desertification
- Loss of biodiversity
- Carbon emissions
- Soil erosion



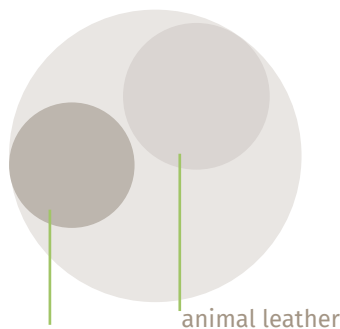
130,000 Hectares of Chaco forest and Yunga jungle have been devastated in the last four years

The waste

In terms of annual ecological footprint, the world population already produces more than 1.6 times what the Earth can absorb in the same period of time, assuming that current solid waste, during production and at end of use, will increase by approximately 60% between 2015 and 2030, with an additional generation of 57 million tons of waste per year.

This brings the total level of fashion waste in 2030 to 148 million tonnes, equivalent to an annual waste of 17.5 kg per capita across the planet.

Textile Industry:



- Consumption of non-renewable energies.
- Use of toxic products for the environment and for humans.

New proposals as alternatives

People are already talking about the fourth industrial revolution and among its characteristics, in addition to the use of technology, a new approach to biology has become relevant.



One of the areas in which many countries are working hard at the same time is the development of leather from vegetables, bacteria, fungi and algae.

With the scenario described above, biology begins to make a relevant contribution to the industry. Bacteria, for example, are used to produce materials or dyes or to replace non-renewable energy. Another application is the production of fibers through the use of enzymes and the biological treatment of their waste. In architecture, bricks are being manufactured without firing from the action of certain bacteria that can solidify the earth without the need to bake them at very high

temperatures with the emissions that this process entails.

Materials are also being produced from carbon as a raw material. And within the new possibilities that these technologies facilitate, one of the areas in which many countries are working hard simultaneously is the development of leather from vegetables, bacteria, fungi and algae.

Moebio bioleather

My contribution to decontamination

For some years now, and after searching for materials that are more compatible with the decontamination of the planet, I have been researching biomaterials of all kinds. In the last year I focused mainly on bioleather as a contribution to the replacement of a source of pollution of great magnitude.

Based on the concept of circular economy, and organic raw materials and proximity, this type of bioleather production does not need complex industrialization chains, so it can be produced on demand, this notably reduces the energy expenditure that means the collection of idle material in the usual industrial processes, thus generating less waste.

The main raw materials are cellulose of plant origin, found in waste materials such as fruit peels, or in the pruning of nearby plants, and bacterial cellulose, which is also an organic by-product, in this case industrial. , from the production of kombucha, a probiotic drink based on tea and sugar. The combination of both celluloses and a series of aggregates are processed by grinding and mixing with heat. They are then molded until dry, at room temperatures or by very mild heat for



a few days. As soon as these bioleathers are removed from the mould, they are ready to be used for all the usual uses of leather: clothing, leather goods, footwear, interior design, car upholstery, etc. These pieces can be sewn, they can be glued, folded, assembled and applied to accessories, closures like the leathers known up to now.

They are currently marketed in 115 x 75cm panels, but the measurements can easily vary according to the size of new molds.

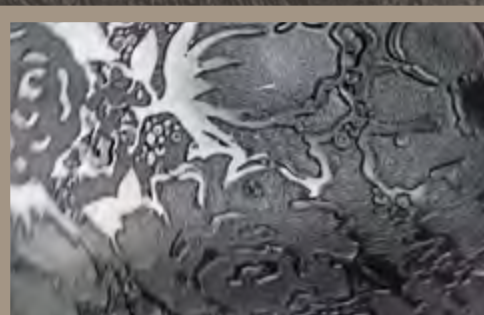
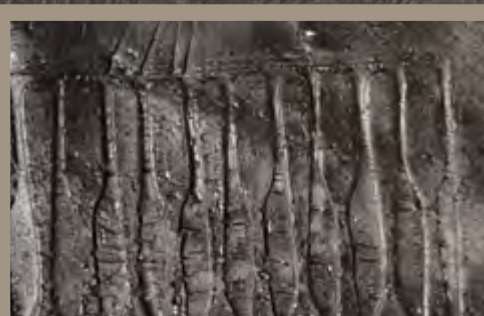
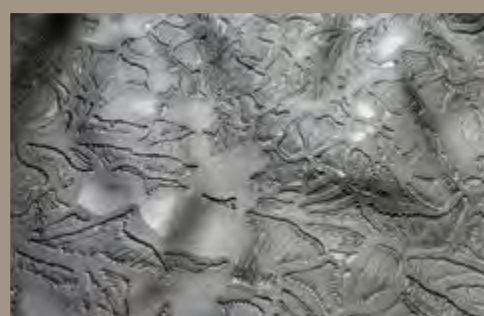
Another novel and inventive contribution with respect to the state of the art is having achieved waterproofing with non-polluting products and the combination of different polymers that give it elasticity, strength, tensile strength and better resistance to friction, which also improves its resistance to the passage of time and allows an infinite number of pleasant textures for human skin.

The production process uses very little water. The energy used to temper the mixtures is minimal. For all this, the emission of carbon and other polluting gasses in the environment is practically ruled out.

The production process as a whole has a complete circularity, once the useful life of the product is over, it can be composted under normal environmental conditions and turned into soil in its entirety in approximately 90 days. Land suitable for growing the vegetables of the new cycle.



Laura Messing,
Architect and Visual
Artist.



Conclusions

Thanks to the work of biologists, designers, architects, artists and producers, a vision for a new regenerative textile industry is taking place.

We have a clear mission to generate business opportunities, as well as a positive impact on society and the environment.

Our objective is to contribute to the transformation of the textile system into a more sustainable production system, by minimising its negative impacts, and contributing to a circular economy.

This proposal deals with new products that, although they have proven efficacy, are not yet they are commercialised massively, for not

having been able to scale their production.

It is expected that in a few years, leathers produced from plant waste and bacteria will be the new reality of the textile industry.

At Biocueros® we look for those interested in accelerating and scaling these production processes, and in connecting their production with the various industries, both suppliers of inputs and manufacture of products.



Brands that already work with biotextiles



STELLA McCARTNEY



LVMH
MOËT HENNESSY LOUIS VUITTON

Salvatore Ferragamo



FOSSIL
EST. USA



Nike - Adidas - Stella McCartney - The North Face - Fendi - Louis Vuitton LVMH - Salvatore Ferragamo - H&M - Osklen - Nanollose - Le Coq Sportif - Karl Lagerfeld - Fossil - and others



**BIOCUEROS**[®]
100% sustainable

Info@bio-materiales.com | Cursos: Bio-materia.com | Biocueros®