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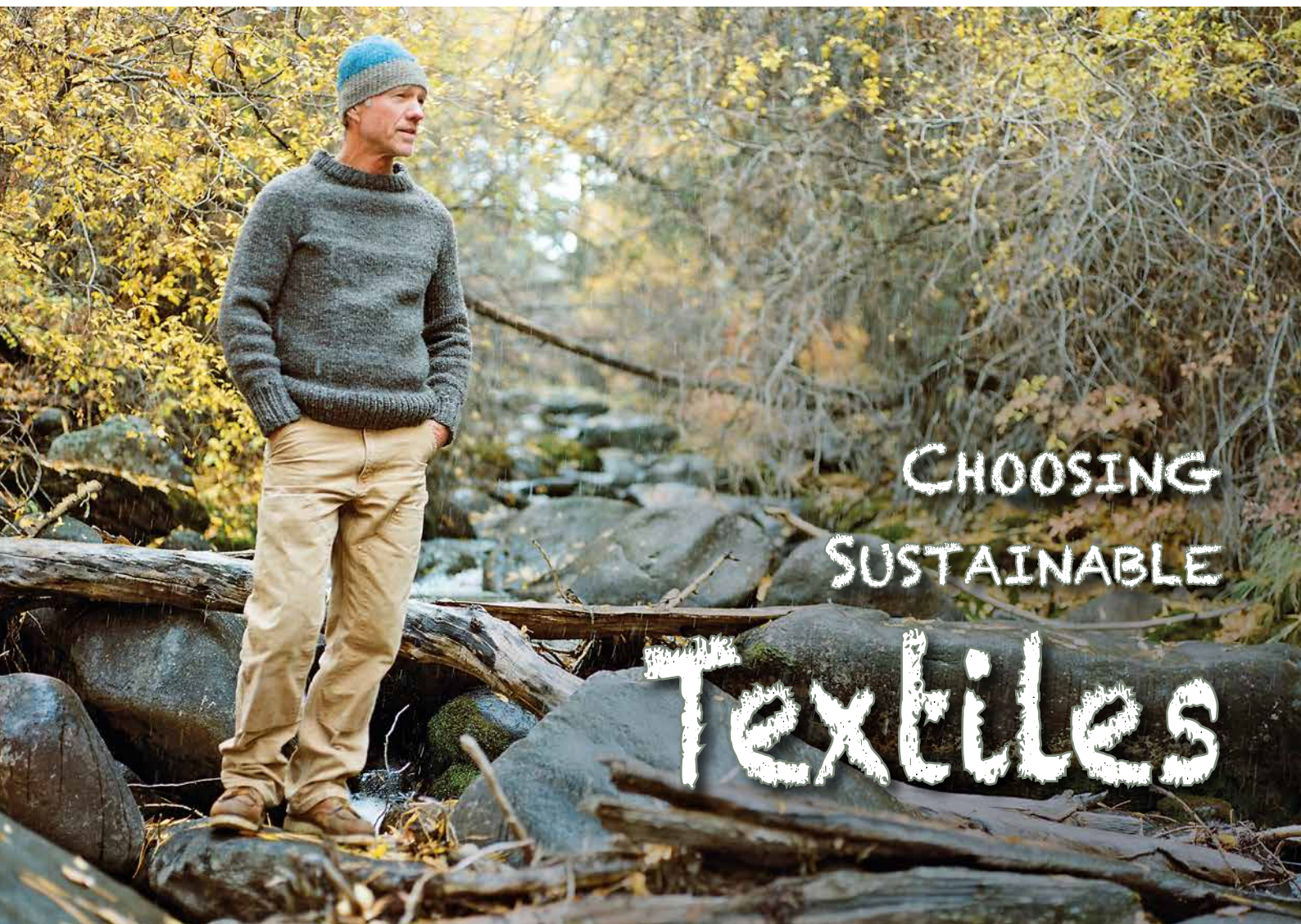
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## A Guide to Eco Fashion & Ethical Materials by Rozie Apps Case study by Poppy Nicol

**L**ocal and organic food is growing in popularity, with even the biggest supermarket brands promoting regionally-distinctive products. It seems we're all becoming more selective about what we put into our bodies. What we wear *on* our bodies, on the other hand, is perhaps given less consideration.

This is despite decades of horror stories about sweatshops, manufacturing conditions in the cotton industry and the carbon footprint of fashion. But it's time to wake up! Just as our supermarkets evolved with consumer demand, the clothing industry needs to do the same.

To date, our desire for cheap, new clothes has pushed the clothing industry in a catastrophic direction.

There are serious issues to address, at all stages of the process, and one of the worst offenders is the cotton industry.

### COTTON

The cotton industry has a roll call of offences: farmers and factory workers receive very low wages; they work in dangerous factory conditions; are surrounded by harmful chemicals; ecosystems are damaged by excessive pesticide and herbicide use; and because the clothing produced is of poor quality, with a limited shelf-life, there is a high degree of waste at the end of it.

The mainstream cotton industry uses 23% of the world's insecticides and 10% of all pesticides, despite taking up just 3% of farmed land globally! It is responsible for poisoning wildlife and

rivers, as well as killing an estimated 16,000 people annually.<sup>1</sup>

Thankfully, there is a revolution underway. The Fairtrade movement is improving farmers' wages, Fair Wear are improving factory conditions, and more companies are seeking to reduce waste and increase fabric recycling, as well as looking for alternative, organic and ethical textiles.

### ORGANIC COTTON

Cotton is always going to be a highly water-intensive crop, but the benefits of organic cotton are clear: healthy soil with high organic matter prevents soil erosion and run-off. It also enables higher water retention, so less watering is needed. Furthermore, organic cotton eliminates the use of harmful chemicals,





**Above:** A modern, clean, well lit, organic cotton production plant in India. **Below:** Organic cotton dress. **Below right:** Bamboo t-shirt / organic cotton hoody.

which otherwise wash into waterways and the ecosystem; encourages biodiversity among plants and insects; and prevents toxic chemicals being transferred into the final product.

It is grown using either 'natural' chemicals like sulphur dust and organic acid-based sprays (such as citric acid, nitrogen and zinc sulphate), or through inter-cropping with maize, sunflower, sweet sorghum, pigeon pea and okra, which act as a decoy for pests.

Currently, organic cotton only counts towards 1% of global cotton production, but more and more farmers are making the transition. Ironically, while the demand for organic cotton is growing, production is presently limited by a lack of availability of non-GM seed.<sup>2</sup>

#### HEMP

A variety of *Cannabis sativa* L, hemp is probably the most popular cotton alternative. It is grown in temperate climates and the plant can grow up to 4.8m (16ft). However, those grown for fibre are planted closer together, reaching heights of 2-3m (6-10ft), with no branches. To extract the fibre inside, the hemp stems go through a process of retting,<sup>3</sup> drying and crushing, releasing long, fairly straight fibres, averaging 1.8m (5.8ft). These are then steamed to release any natural binders, leaving an easily weavable fibre.

Many farmers who grow hemp as a rotation crop praise it for excelling without the need for fertiliser, and for aerating the soil as it grows. Hemp has many uses as well as for making fabric: these include the production of paper, oil, seed, building materials, pharmaceuticals and even car body parts.



© Jim McKenna - www.moe-boutique.co.uk

#### BAMBOO

Bamboo is a highly sustainable plant and is becoming an increasingly popular alternative to cotton. It is believed to be the fastest-growing plant in the world, and grows naturally without fertilisers, requiring little water. Bamboo produces high yields with low inputs and is cut rather than uprooted. It then regrows without needing to be replanted, which promotes soil stability.

Bamboo produces a soft-as-silk textile that is kind to skin. Its fibre is 100% biodegradable. According to Bamboo Clothing (BAM),<sup>4</sup> the yield of bamboo is 10 times more per field area than cotton. However, the manufacturing of bamboo is less sustainable, as it requires high energy input.

Bamboo fabric is a reconstructed or 'semi synthetic' fabric, so instead of possessing a naturally occurring fibrous consistency, which can be spun into threads, it is first reduced down to the most basic elements at molecular level (polymers). This is then shot through a nozzle to make stringy fibres that get spun into a fabric.

If you are interested in buying bamboo clothing be aware that bamboo can be converted into a usable material through either a chemical or mechanical process. The sustainable and ecological process is mechanical as this prevents the use of harmful chemicals. Eco-factories must have certification to prove



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their process doesn't use chemicals, one being the OEKO-TEX® System.<sup>5</sup> Manufacturers who do follow this system produce high-quality bamboo material, which is a sustainable alternative to cotton. Furthermore, bamboo material is thermo-regulating, breathable, hypo-allergenic and very comfortable to wear.

#### EUCALYPTUS / LYOCCELL

Eucalyptus is a woody, flowering tree, or sometimes shrub. There are around 700 different species, mostly found in Australia and southeast Asia. Several varieties also grow in Europe, North America and Africa. It is a fast-growing

It is believed to completely degrade in just eight days in a waste treatment plant. In 2000, the Tencel® manufacturing process received the 'European Award for the Environment' from the European Union.

Although the process of creating eucalyptus material may be considered semi-sustainable, the planting and growing of it is, unfortunately, far more environmentally destructive. Where large plantations are grown, it tends to be that huge expanses of forest have been destroyed. The Iberian Peninsula across Spain and Portugal is just one example of such devastation.

The Iberian Peninsula is home to diverse ecosystems including the critically-endangered Iberian lynx, Spanish imperial eagle and great buzzard, as well as many plants and trees, including the native cork oaks (*Quercus suber*) and holm oaks (*Quercus ilex*) – most of which have been felled. Portugal has the second largest eucalyptus plantation in the world (300,000 hectares / 741,000 acres). Unfortunately, it has caused severe degradation of the environment, draining marshland and destroying vital woodland in the area.

#### WOOL

Farmers who produce organic wool follow strict standards. These are set by The Soil Association in the UK and the Organic Trade Association in the US.

Farmers take a preventative approach to disease, so that animals are given as few antibiotics as possible; the sheep feed from chemical-free fields;

plant that has attracted attention for its oil, which can be used for cleaning and as a natural insecticide. However, eucalyptus also makes an excellent fabric. It is known as lyocell when it is in fabric form.

Eucalyptus is similar to bamboo in that, being woody, it takes significant energy to convert it to a soft fibre before it can be used for clothing. Some people have questioned how ecological eucalyptus material is, given this process, and because formaldehyde is sometimes used to break the matter down. However, companies such as Tencel® (the main producers of lyocell) avoid chemicals and use only Euro Stewardship Council certified pulp.

The only chemical Tencel® does use is the non-toxic solvent 'amine oxide', used to digest the wood pulp. The production system is also closed loop, reusing the water and solvent. The end pulp can be recycled and biodegrades.



**Above:** Eucalyptus t-shirt. **Left:** Hemp hooded jacket. **Below and title picture:** Organic wool is used to make a wide range of natural clothing.

and toxic chemicals are not used in the manufacturing process – producing a final product that is natural, renewable, soft and durable.

Wool's other eco-credentials include absorbing harmful pollutants from the air, which are not re-emitted. It is estimated that wool used in interiors, for example, can help purify the air for up to 30 years. At the end of its life, wool can be returned to the soil, where it decomposes very quickly, releasing valuable nutrients into the ground as it degrades.

#### ORGANIC INK & NATURAL DYES

As well as making sure the materials used in the clothing industry are sustainable and ecological, colouring and printing needs to follow the same principles. Natural dyes have been used for hundreds of years, so moving the industry towards these is easier than finding new, safe inks.

There are various issues with mainstream inks, including that many contain a range of Volatile Organic Chemicals (VOCs). The alternative to these highly chemical inks, are water-based ones, which don't contain solvents, PVC or phthalates.<sup>6</sup> This means there are no harmful chemicals to wash away.





### WHAT TO CHOOSE?

Hemp, bamboo and eucalyptus seem better candidates for a sustainable alternative to cotton than simply organic cotton, as they grow faster, need less water and take up less space while growing. They are also grown and manufactured in America and Europe, where it is easier to track that harmful chemicals aren't being used in the process – and to ensure that farmers and factory workers receive a fair wage!

Obviously choosing materials with eco-credentials is very important, but it is crucial to see the whole picture by also scrutinising the manufacturing process and the conditions of the producers. The Fairtrade Organisation has been working since 1992 to make sure farmers and workers across the globe receive a fair wage for their harvests. Today, there are over 1.4 million farmers and workers in 1,140 Fairtrade organisations, across 74 countries.

Buying products with the Fairtrade mark is a promise that you are supporting “farmers and workers as they work to improve their lives and their communities. The mark means that the Fairtrade ingredients in the product have been produced by small-scale farmer organisations or plantations that meet Fairtrade social, economic and environmental standards. The standards include protection of workers' rights and the environment, payment of the Fairtrade Minimum Price and an additional Fairtrade Premium to invest in business or community projects.”<sup>7</sup>

There is also a non-profit called Fair Wear, which works to improve conditions in the factories where materials are turned into products. Left unregulated, these factories have been known to provide terrible working conditions, low wages, employ young children and even cause deaths.

Fair Wear have created a list of labour



*Above: Harvesting indigo for dying.*


*Below right: Bamboo dress.*

standards to ensure factory workers are treated fairly, and are working with companies in the clothing industry to improve conditions. Currently, the organisation has not found any one product that they consider to be 100% fair, but Fair Wear do have a list of brands who are performing at 90%, and are working hard towards achieving that additional 10%.

Fair Wear states, “Supply chains are complicated and international – which means no single factory, brand or government can improve things alone. This kind of change doesn't happen overnight. So no, we don't certify. We report, so you can check on how your favourite Fair Wear member brands are performing.”<sup>8</sup>

### THE FUTURE

Although there is some great progress being made, there are so many elements of the clothing industry that still need to evolve. However, if each link in the chain moves towards ecological and ethical standards, this evolution will happen more quickly.

Ultimately, the real solution, as a consumer, is to recognise that fashion is all about making money – so in order to see change, we must vote with our pockets! We need to stop buying into the throwaway culture of fashion seasons and instead invest in reputable, long-lasting items. After all, true value is not in quantity, but in quality 

*Rozie Apps is assistant editor and social media guru at Permaculture magazine.*

*Permaculture* magazine has teamed up with Rapanui, a UK-based ethical clothing company, to launch its very own *Permaculture* clothing range. Rapanui produce beautiful t-shirts and sweaters, which are as artistic as they are comfortable, using organic cotton, bamboo and eucalyptus. Rapanui source their products from factories that follow the Fair Wear principles and colour them with safe dyes. We feel strongly about sustainable fashion and know our readers do too... To see our new range visit: <https://permaculture.teemill.co.uk>

### REFERENCES

- 1 [http://tiny.cc/soil\\_assoc\\_cotton](http://tiny.cc/soil_assoc_cotton)
- 2 <http://tiny.cc/farmhub>
- 3 <http://tiny.cc/retting>
- 4 [www.bambooclothing.co.uk](http://www.bambooclothing.co.uk)
- 5 [www.oeko-tex.com](http://www.oeko-tex.com)
- 6 <http://tiny.cc/Phthalate>
- 7 [http://tiny.cc/fairtrade\\_workers](http://tiny.cc/fairtrade_workers)
- 8 <http://tiny.cc/fairwear>

### Five Purse-Friendly Tips for a More Sustainable Wardrobe

1. Buy 'pre-loved' clothes from charity shops or online auctions.
2. Ask for a special item of eco-clothing as a birthday or holiday gift.
3. Hold a clothes swap with friends!
4. Save up to buy Fairtrade and eco-brands as a special treat.
5. Invest in timeless, quality fabrics and styles that will last for years. If you calculate cost per wear, it's a bargain!







## CASE STUDY

# The Clothing Locavore

by  
Poppy Nicol

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Founder of Fibershed, Rebecca Burgess, was exasperated with the injustices of the fashion industry. So she set herself a one year challenge – to only wear clothing sourced within 150 miles of her California home. This led her to create a proto-type wardrobe, with dyes, fibres and labour all sourced from her bioregion: soil to skin. “Instead of continuously feeling down-trodden by the stories behind my material culture, I decided to change the narrative – beginning with my wardrobe,” Rebecca explains.

### DIVERSE BIOREGIONS

Rebecca began to question fibre production whilst exploring the ethnobotany of a number of Native American Indians. She witnessed intimate relationships with the bioregions inhabited and dense polycultures of food, medicines and dialects.

Rebecca was also inspired by the artisan industries of northern Thailand where gardens full of natural dyes and fibres, such as indigo, grow alongside mango, pineapple, tamarind and citrus. Amidst these rich polycultures, local textile economies were thriving.

These encounters and an intensifying awareness of the devastating water and soil damage left by textile industries led to Rebecca's challenge. From this emerged Fibershed, an organisation seeking to support and develop more regional, ecologically-balanced, community-organised textile cultures.

There are four key components to Fibershed's vision:

1. To encourage reliance upon renewable energy sources while reducing the extent of petrochemically-reliant textile industries;
2. Increase organic production and reduce toxic dye residues and use of herbicides and pesticides;
3. Decentralise textile supply chains and support regional communities of artisan-farmers, producers and designers;
4. Empower communities to support and develop these emerging Fibersheds through education and training.

### GROWING COLOUR

The development of farming and production fibre apprenticeships, community land grants and land trusts, DIY dye and weaving labs are fertilising and diversifying at the California Fibershed.

The organisation is involved in mapping regional artisan farmers, producers and designers and developing sales outlets which include two farmers' markets and an online directory of certified farmers and retailers.

As well as supporting small-scale fibre and dye producers, Fibershed is working with urban communities to increase acreage of productive fibre and dye gardens. These include plants such as indigo (*Indigofera tinctoria*), pokeberry (*Phytolacca americana*), coffee berry (*Rhamnus californica*), Californian golden rod (*Solidago californica*), coyote brush (*Baccharis pilularis*), sticky monkey (*Mimulus aurantiacus*) and wild sage (*Salvia verbenaca*). Such fibres and colours can be particularly effective as regenerative crops on brownfield sites.

### FIBERLABS

Fibershed is also in the process of developing a FiberLab. This space will offer workshops on milling, spinning, felt-making, embroidery and dying.

This will include space and equipment for individuals and small businesses to hire, via a membership scheme. The labs will also host research exploring the potential of fibre-wool blends and fibre-food production.

Although Fibershed originated in California, there are now a growing number of bioregional Fibersheds across the US and beyond. They host the annual international Wool Symposium in Pont Reyes. For more information see: [www.fibershed.com](http://www.fibershed.com)

For a directory of farmer/artisans and the wonderful range of garments produced see: [www.fibershed-bigcartel.com](http://www.fibershed-bigcartel.com)

Poppy Nicol is a community gardener and researcher based in South Wales.

### FURTHER READING

*Harvesting Color: How to Find Plants and Make Natural Dyes* by Rebecca Burgess, ISBN: 9781579654252.