

Amgueddfa Cymru - National Museum Wales



# Preparing for the Global Citizenship Mini Challenge



**SOURCE PACK**



We can learn a lot about the issue of Sustainability and the Woollen Industry by studying Welsh history as well as examples from the modern world.

Study these sources about sustainability and the woollen industry past and present. The sources will help you to understand how and why wool came to be so significant a part of Welsh history and why it is still important. You can explore wool as a sustainable product and sustainability in the woollen industry generally.

If you would like to know more why not visit the National Wool Museum in Dre-fach Felindre, West Wales. You can also research the industry on websites such as Historic UK. More can be found on the Welsh woollen industry research page of Amgueddfa Cymru's website.

**ISSUE: Living sustainably**

**FOCUS: Wool as a sustainable product**



The history of the woollen industry in Wales

## SOURCE 1: The National Wool Museum at Dre-fach Felindre, West Wales

Cambrian Mills and the village of Dre-fach Felindre are national heritage sites. Launched as the Museum of the Welsh Woollen Industry in 1976, the mill reopened in March 2004 as the **National Wool Museum** following a two-year, £2 million refit partly funded by the Heritage Lottery Fund.

The National Wool Museum tells the story of wool in Wales. Historically and into the 19th century, the production and processing of wool surpassed even coal as the most important of Wales's industries. The Teifi Valley was the centre of the West Wales woollen industry.

David Lewis erected Cambrian Mills on the site of a former small water-powered weaving workshop in 1902. The new mill was to supply the need for woollen cloth for working men in the

coal and steel industries. With a drop in demand for wool and textiles the mill's fortunes declined. In 1965 the mill (with 30 employees) was put up for sale and in 1976 Amgueddfa Cymru converted part of the mill into a museum. In 1984 Cambrian Mills finally closed and Amgueddfa Cymru took control of the whole site. Once the centre of a thriving industry in this area, this mill manufactured woollen cloth, blankets and items of clothing that were sold across the world.

The photographs below show the mill before and after a devastating fire in 1919. The fire destroyed parts of the building and damaged important machinery including the spinning machine and several of the looms. The spinning machine runs the whole length of this building and would originally have been one of two, occupying the whole of the first floor.



A photo of Cambrian Mills following the fire in 1919



The National Wool Museum following its redevelopment in March 2004



(PHOTOGRAPHS: AMGUEDDFA CYMRU)



## SOURCE 2: The cottage or domestic industry

Before factories, the manufacture of products like textiles was done at home, usually in small cottages. This was known as the cottage or domestic industry. Everything was done on a small scale and was slow and laborious.

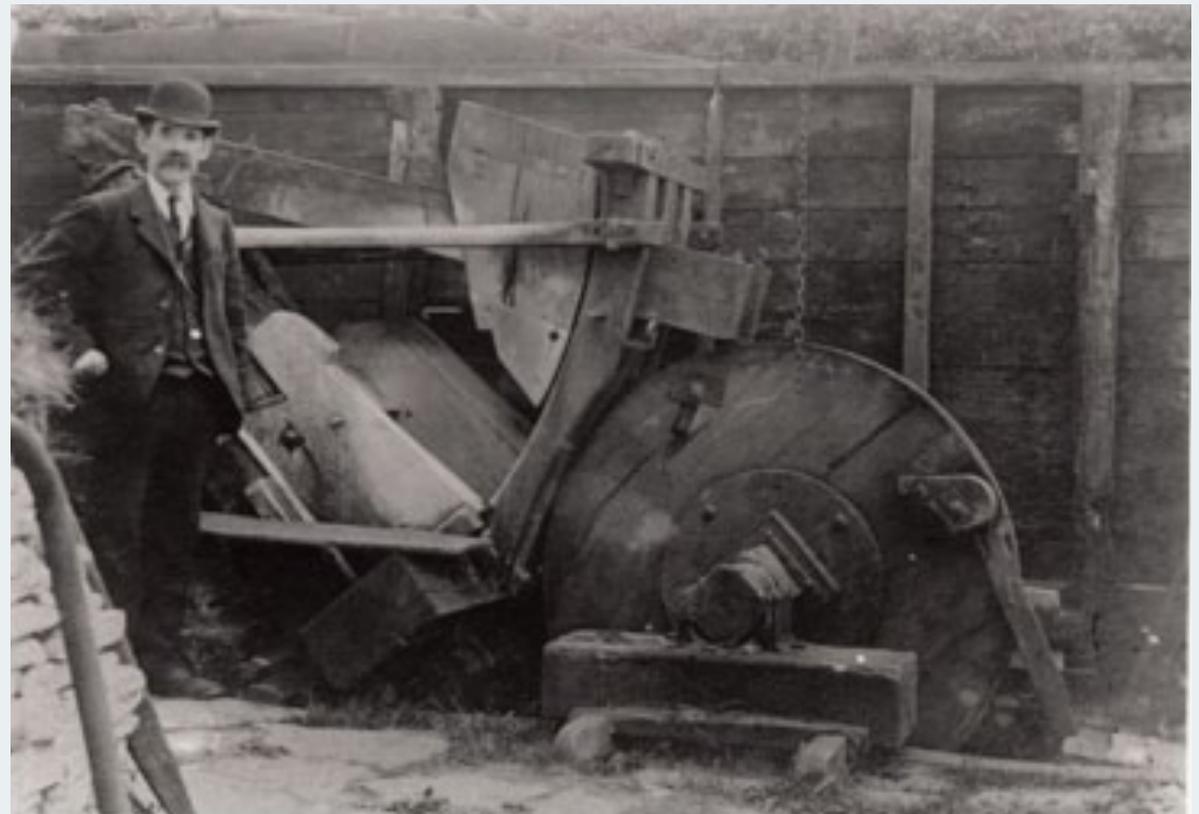
## SOURCE 3: Fulling

The woollen industry was one of the first, alongside corn mills, to harness water to power machinery. The first mechanised process of the woollen industry was fulling, used since medieval times. Fulling is a step in woollen cloth making that involves the cleansing of cloth (particularly wool) to eliminate oils, dirt, and other impurities, and making it thicker.

This carried on into the early twentieth century when chemicals replaced fuller's earth and urine. The mechanised machine was known as fulling stocks.

The photograph below shows fulling stocks used at Pontardulais in 1936.

Originally, fulling was carried out by pounding the woollen cloth with the fuller's feet, hands or a club in a tub of warm water, urine and fuller's earth. A man would go round the village in the morning collecting urine and paying a penny a bucket for it. This gave rise to the saying 'spending a penny.'



## SOURCE 4: The factory system

When the population began to grow quickly after 1750, there was a need for more cloth to be produced. The cottage or domestic system could not meet this demand because the hand spinning wheels and looms were too slow. This inspired the invention of new machines, which were much quicker and able to produce far more. Richard Arkwright's water frame

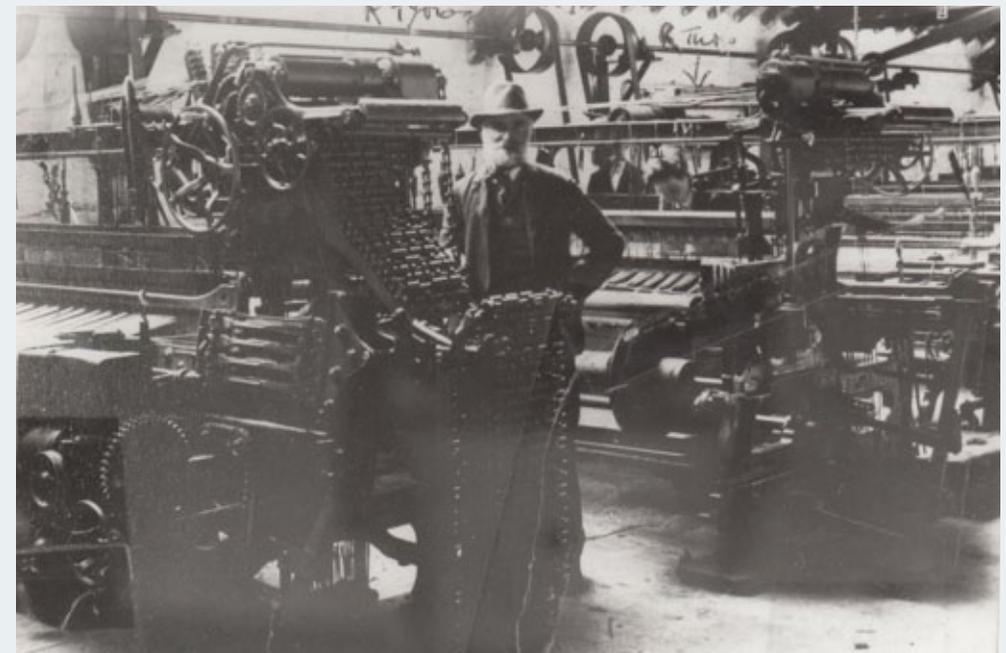
(known as the Spinning Jenny) was a particularly important development because it was too big to be used in the home and needed water to power it. From this point onwards spinning was usually done in mills (factories). These mills housed the new machines and, as machines were driven by water, were built by the sides of fast-flowing streams.

Historical photographs from the *People's Collection Wales*



CASGLIAD Y WERIN CYMRU  
PEOPLES COLLECTION WALES

An old water-driven Welsh woollen mill at Pen-Y-Groes, north Wales



CASGLIAD Y WERIN CYMRU  
PEOPLES COLLECTION WALES

Penmachno Woollen Mill, Betws-y-Coed, Caernarfonshire, opened in 1839 and closed in the 1990s

## SOURCE 4 *continued*

A book about the history of Carmarthenshire noted:

'In 1850, the power loom was invented; as a result of this new invention and that of the new fulling machine, the industry flourished until the end of the century as never before.'

There was a rapid increase in the number of factories, and between 1860 and 1900 about 21 factories appeared in the two parishes of Llangeler and Penboyr alone. It was this period which saw the change from the domestic to the factory system in Carmarthenshire.'

Historical photographs from the *People's Collection Wales*



Workers at Sarn Mellteyrn wool factory, c.1885



Woollen mill workers at Llanidloes, 1890s

## SOURCE 5: Welsh wool and the Great War

On Saturday 19 September 1914, in a typically stirring and patriotic speech, Chancellor of the Exchequer David Lloyd George set out his vision for a Welsh army corps. The Corps was to have fought alongside - but be distinct from - the English army, have Welsh-speaking officers and, most importantly of all, it should have had its own highly identifiable uniform of homespun Welsh Grey or *Brethyn Llwyd* cloth.

On the face of it the plan was a disaster, with 13 Welsh mills contracted to produce the Brethyn Llwyd cloth, and each coming up with their own shade of grey. As Mark Lucas, curator at the National Wool Museum, explained, '*Brethyn Llwyd* was made from the wool of black sheep, which was much more scarce than wool from a white sheep. So mills were each forced to experiment with their own compositions and manufacturing processes.'

It all led to shambolic shortages and delays in getting uniforms to Welsh regiments. In fact, the uniforms produced for the 11th Battalion Welsh Regiment by outfitters Messrs' Jotham of Cardiff were so brown that it led to the unit becoming nicknamed The Chocolate Soldiers.

WELSH ARMY CORPS.

Article Tendered for: *Brethyn Llwyd*

Name and Address of Firm Tendering: *W. & J. Jones & Co.*  
*Cardigan, W. I.*  
*Caerdydd*

*Blawen, Gwynedd, N.W.*  
Signature

QUOTATION.			Remarks	Quantity
Price	Quantity of Cloth	Quality		
<i>Not stated</i>	<i>Not stated</i>	<i>Wool 28 &amp; estimate</i>	<i>Should require further particulars before stating price of cloth should be prepared to make some price and by</i>	
			<i>Sample enclosed</i>	



## SOURCE 5 *continued*

Supply problems hit the project from the outset, and fewer than 9,000 *Brethyn Llwyd* uniforms were ever produced for the 50,000 Welsh volunteers. By May 1915 cost-cutting meant Lloyd George's unique Welsh Army Corps became part of the regular British Army, with the Welsh Grey colours having never made it into battle.

In spite of all this the historian Dr Robin Barlow of Aberystwyth University thinks the idea did have important benefits for the war effort: 'The decision to use *Brethyn Llwyd* did allow the Welsh Army Corps to claim the distinctiveness of a special uniform, produced in Wales, for Welsh soldiers. Perhaps most importantly, it provided a great boost to recruitment. Indeed, by the end of 1915 more than 50,000 Welshmen had volunteered for what was to become the 38th (Welsh) Division.'

## SOURCE 6: Extracts from a *Wales Online* report on London Fashion Week, 27 March 2013

Theirs is a historic brand associated with luxurious Welsh wool blankets and hers is a fashion line more used to dressing pop stars in leather. Welsh designer Jayne Pierson has joined forces with Melin Tregwynt on a collection merging old techniques with new ideas, and it's just been unveiled after months of planning at London Fashion Week.

The autumn/winter collection features some 30 looks, the result of two new woollen fabrics created with the company which has a working mill on a site in Pembrokeshire dating back to the 17th century.

Jayne was invited to the Castlemorris whitewashed mill and even worked a loom – a first time experience for the designer who dresses singers like La Roux and Diana Vickers. 'They actually set me up on a loom so I had a hand in the process,' she recalls.

'I'd never seen how wool was actually made before. Normally I just order the fabric and it turns up in the post.'

## SOURCE 6 *continued*

The creative process has also made her reconnect with a Welsh culture she wants to see enjoy a revival.

She says: 'I'm not a textile person although I work in textiles – when I design a fabric it's done on Photoshop. I was so lucky to witness it actually being made on my doorstep. I went from that to being completely hands-on and watching this amazing, noisy process. The spools dart back and forth as they make the yarn, and it's really clunky and noisy. It's wonderful to go back and remember how things used to be when we had so much manufacturing in Wales, and it would be great if we could go back to that. I thought it would be great to use this Welsh heritage in an up-to-date way, and it's also been about reevaluating my relationship with nature and redeveloping an understanding with nature.'

A white sheep with thick, curly wool is standing in a grassy field. The sheep is facing right and has a yellow tag in its ear. The background shows a hazy, mountainous landscape under a grey sky. The text "Sustainability and the modern woollen industry" is overlaid in white on the lower part of the image.

# Sustainability and the modern woollen industry

## SOURCE 1: Extracts from an article in the *Daily Telegraph* online 5 October, 2014

### Wool is back in fashion as sales jump 70pc

Sales of British wool have jumped by two thirds to £300m in six years, as wearing wool comes back in vogue. The UK wool industry as a whole – which includes clothing, accessories, carpets and transport upholstery – is worth £3bn. Some 90% is exported, mainly to Japan, China, Germany and the USA, as demand for British tweed and other “rough style” cloth and designs rises.

In its heyday the British wool industry employed 50,000 people at 140 mills but the industry has struggled in recent years. However, annual sales have risen by 70% from £180m in 2007 to £300m last year as the trend for quintessentially British brands has come back into fashion. The UK wool weaving industry now employs 8,000 people in around 40 fully functioning mills. Production is growing at a rate of more than 10% a year.

Once woven, the wool is mostly sold abroad as there are few brands which manufacture clothes in the UK.



Lesley Prior, a sheep farmer based on the outskirts of Exmoor, supplies Cornish surf-wear brand Finisterre. When they started collaborating she had just 28 Bowmont Merino sheep. Now she has 200. The wool is sheared and taken to Yorkshire to be woven into cloth then on to Scotland to be turned into jumpers and beanie hats.

‘It is a very exciting time to be in wool,’ she said. ‘The companies that survived have re-invested and thanks to fantastic design the industry is growing again.’

The revival was sparked by the Prince of Wales who, concerned by the state of the industry, launched the Campaign for Wool five years ago.

## SOURCE 2: Extracts from the website of the organization *Wool Revolution* August 2015

- Wool is a sustainable resource
- Buying wool supports the raising of sheep for their fleece rather than food
- Using wool products supports farmers throughout the world, especially those letting their sheep graze on pesticide-free pastures
- Most Australian Merino wool is produced organically or with low use of harmful chemicals
- The processing of wool requires very little environmental impact compared to other natural fibres or man-made fibres
- Wool is fire-resistant and does not burst into flames but just smoulders
- Merino wool is renowned for its warmth but it has also been worn for centuries by Bedouin tribes of the Sinai desert where there is extreme heat. Merino keeps you warm when you're cold, and cool when you're hot
- Merino's wool is long lasting and can be bent 20,000 times before breaking
- Wool holds dyes better than many other natural fibres. Wool is also available in a variety of natural earth tones that require no added dyes
- Wool also has natural anti-microbial properties. Hospital studies have shown that bacterial colonies are common in cotton sheets while not present on Merino blankets subjected to the same environmental conditions

## SOURCE 3: Extracts from the Prince of Wales official website ([www.princeofwales.gov.uk/](http://www.princeofwales.gov.uk/))

### 1. Report of the launch of the Campaign for Wool, January 2010

The Prince of Wales launched the Campaign for Wool in January 2010 as an initiative to expand the market for British and Commonwealth wool and promote awareness of its environmental benefits.

His Royal Highness is passionate about natural sustainability and knows that the production of wool involves far lower carbon emissions than man-made fibres. Carpets made from wool also reduce heating costs and provide immeasurable safety benefits than their synthetic counterparts. Unlike many man-made materials, wool naturally bio-degrades at the end of its useful life.

On a freezing cold day in January, The Prince of Wales launched the Campaign in front of a group of fashion, carpeting and insulation industry experts. In his speech, The Prince highlighted the many benefits wool had to offer. Not only is it a sustainable, versatile material which keeps us warm and cool at the same time, buying wool rewards some of the hardworking sheep farmers in the world.



HRH THE PRINCE OF WALES · GETTY IMAGES

## SOURCE3 *continued*

### 2. Extracts from a speech by HRH The Prince of Wales for the Campaign for Wool reception, Clarence House, 10 June 2014

*Ladies and Gentlemen, I am so glad to welcome you to the garden of Clarence House.*

*I sometimes think that too many people have forgotten or perhaps they never even realised in the first place that not only is wool one of the most resilient, ecological and sustainable natural fibres in the world, it is also one of the safest because it is so fireproof.*

*As I never tire of pointing out, wool is not only one of the oldest fibres known to mankind, it is also one of the most beneficial, but, again, as with so many other things we have abandoned and thrown away (such as rare breeds and varieties of species). During the 20th century, we have lost sight of the long-term value of Nature and her genius. It is perhaps a sobering thought that only 1.3 per cent of clothes today are made from wool, whereas 60 per cent are made from synthetic materials. And in the world of carpets, only 20 per cent still use wool, while 80 per cent are synthetic which, apart from anything else, will take decades to biodegrade in landfill, if they degrade at all.*

*I take some heart from the fact that my Campaign for Wool, which I brought into being to prevent its complete demise and to help struggling sheep farmers and the rural communities associated*

*with them all over the world, has already enjoyed some success in alleviating this alarming state of affairs. It is encouraging that sheep numbers ... have now begun to increase again in Britain and Australia and several other important markets. And I don't like to tempt fate, but it is also the case that, since my Campaign was launched, the price of wool has tripled, which means that farmers and wool-growers in this country, and across the Commonwealth, are receiving a little more than they were for their wool, which might thus enable farmers and rural communities to remain doing what they do so well, helping to maintain the countryside we take for granted.*

*I brought together wool interests, wool organizations and the fashion sector to encourage them to work together for a better economic landscape and common benefit.*

*The primary aim of the Campaign is simply to increase the demand for wool by explaining its many benefits to consumers. It is the most remarkable fibre. Because wool is a living material, it has a natural cell structure which allows it to adapt to its environment; wool absorbs moisture and releases it later to regulate humidity so, of course, this makes it a brilliant chemical-free insulating material. Most importantly though, as you have witnessed today, wool has remarkable fire resistant and fire retardant qualities.*

*And that, Ladies and Gentlemen, is just one of the reasons why I very much hope that you can continue to support my Campaign.*

## SOURCE 4: Groups promoting the Welsh Woollen Industry

### (i) Extracts from the *Cambrian Mountains Wool Group Press Release, 9 April 2015*

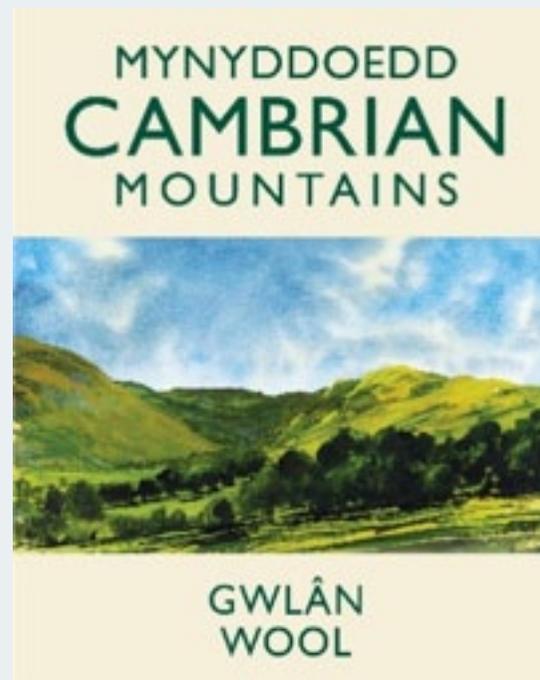
The Cambrian Mountains Wool Group is an exciting initiative to develop and promote one of our regional assets – the wool farmed in the Cambrian Mountains Region. The team of four businesswomen – a knit designer, a fashion and textiles business advisor, a feltmaker and a yarn shop proprietor – are united in their commitment to champion the value of Welsh wool and make it more commercially available, overcoming the obstacles of bringing it to the wider market.

The women have been working to explore the possibilities of sourcing, buying, processing and marketing wool that not only has genuine regional provenance but is also of exceptional quality. As part of the study, and to showcase the versatility of wool from the Cambrian Mountains Region, the Design Challenge was launched and designer-makers from the UK and beyond were invited to submit ideas for using the wool fleece, yarn and fabric. 35 out

of almost 130 entries were selected to form a showcase talking point, challenging designers, manufacturers and consumers to raise their expectations and think differently about Welsh wool. The exhibition will now go on tour and help determine the next phase of development for Cambrian Mountains Wool.

Textiles business advisor Suzi Park sums up the Wool Group's experience: 'The market interest and demand for wool

textiles with provenance, made in Wales from Welsh farmed wool, was always clear. Less certain was the quality of "really Welsh wool" and its suitability to the range of purposes we want – from clothing to flooring. The end-results have exceeded all our expectations. The locally farmed Welsh mule fleece ... has been transformed into an inspirational collection of exquisitely made pieces. The Challenge Collection is a real tribute to one of Wales' most iconic and enduring treasures: its wool.'



## (ii) The *Organic Wool Wales* Project

From the website of *Organic Centre Wales*

Wool is a wonderful, versatile, natural renewable resource but it is often undervalued. Llynfi Textiles, a design and clothing company, Ystrad Traditional Organics and Organic Centre Wales (OCW) have been working together to try and change all that. The team have been busy drumming up interest in wool through the Organic Wool Wales project.

The Organic Wool Wales project, which has been running since 2011, commissioned 100m of fabric to be made from organic wool supplied by Ystrad Farm in Brechfa near Carmarthen. Designers and garment makers across the UK were then invited to submit their ideas for showcasing the fabric. The result was a collection of Organic Welsh Wool including dresses, boots, bags, jackets, upholstery, a rocking chair and even a pair of bloomers!

Official Organic Wool Wales Project website and Facebook page



## SOURCE 5: Extracts from an article by Sarah Lonsdale, *Daily Telegraph* online, 22 November 2012

### **Eco living: The mattresses that last 50 years**

*Sarah Lonsdale learns how a wool-stuffed mattress can outlast internally sprung products by decades, cutting down on waste.*

Back in 1968 Mary Fletcher bought a mattress. Forty-five years later, she still sleeps on it, 'the most divinely comfortable mattress I have ever slept on'. Apart from being beautifully restful, the mattress should be good for another 45 years and more, during which time it will have saved at least 10 conventional mattresses from being made, discarded and sent to landfill.

This is the story of Mary Fletcher's mattress (and) ... also the story of how crazy it is that we send millions of mattresses – 144,000 tons' worth, including 84,500 tons of perfectly reusable steel – each year to landfill.

Mary's bed has an 'indestructible' steel spring base, topped with a mattress stuffed with silky, long-haired sheep's wool. 'Because it is made of wool, it is brilliantly cool even in 35C [95F] nights, and wonderfully warm in really cold winters. It is also just the

right firmness. I have a difficult back and it is the only mattress I can comfortably sleep on,' says Mary, 84, now retired and living in rural Oxfordshire.'

'Every few years, it needs to be re-carded, as the wool slowly compacts,' says Mary. Mary submitted her mattress to this process four times. Almost despairing that she wouldn't be able to continue sleeping on her emaciating mattress, Mary found Rhiannon Rowley of Abaca Organic, who makes mattresses in Wales from organic British wool. It took six hours to fill Mary's mattress, with a combination of her original wool, and a top-up of Dorset Horn wool, which most closely matched Mary's existing stuffing. Rhiannon was so impressed with the results that she plans to make more all-wool mattresses herself.

## SOURCE 6: Extracts from an article by Lucy Siegle, *Guardian Online*, 14 September 2014

Wool is poised to make a comeback, refashioned as a 21st-century fibre with excellent sustainable credentials. So good news for farmers, who for years have had to burn fleeces they couldn't afford to process. Is it good news for sheep, though? Undercover Peta footage appeared in July which showed a number of horrifying animal rights abuses in shearing sheds in the US and Australia (which between them produce 90% of the world's wool), leading the animal rights organisation to call for a wool boycott.

A decade ago Peta called for a boycott to end mulesing. This is a practise where the sheep's rear end is, in effect, chopped to prevent flies laying eggs. Now brands such as Marks & Spencer refuse to buy wool from mulesed sheep. Although welfare standards for sheep still differ among Australian states and mulesing has not been phased out, the threat of a boycott makes retailers source more carefully. So it could be useful.

## SOURCE 7: Extracts from an article written for the *Ethical Fashion Forum*, by Nicola Jenkin, 10 December 2012

**About the writer:** When writing this article, Nicola Jenkin was an expert in sustainability and fashion, working with the organization 'Best Food Forward' (BFF). BFF are respected world leaders in ecological foot printing and have worked with the European Commission to encourage countries, organizations and companies to be more eco-friendly.

### **Should we be sheepish about wool's sustainability record?**

To start with, we need to identify the key issues associated with wool production and processing for the fashion industry – from a sustainability perspective. These can generally be classified into three areas:

- The raising and breeding of sheep, which requires land and food
- Water consumption by sheep and use during manufacture; and
- Use of chemicals in the production of wool, yarns and fabrics

## SOURCE 7 *continued*

It's not that easy to determine the environmental impact associated with the wool supply chain, as there is enormous diversity in wool production between and within countries. Measuring impact can be confusing when the meat, skin, wool and manure is all taken into account, instead of just the wool – this can skew results.

There is also limited data for wool farming, making it difficult to present an 'average' global representative assessment of the environmental impacts of wool. Having said that, there is still enough information out there to shed light on these three areas, and to draw some conclusions.

Wool is a wonderful fabric that we're not going to stop using any time soon, and it compares quite well to other fabrics. However, it's not perfect. For fashion designers who want to use the most sustainable wool, there are three key things you need to do:

1. Check your wool suppliers – make sure your sheep farmers aren't contributing to desertification (using too much water and turning land to desert) or involved in mulesing.
2. Think about your water use – get your wool from countries where there is plentiful water and where sheep farming is a good use of land; and

3. Work with your suppliers and manufacturers to reduce the impact of chemicals and dyes.

Let's explore these a little further.

**Sheep Farming:** Sheep require land to graze. Fortunately, from a sustainability point of view, this grassland is often not suitable for other agricultural systems such as crops. However, there are issues associated with grazing, with one of them being overpopulation, which can exhaust grasslands.

In addition, sheep also produce methane, and in countries such as New Zealand, it is estimated that 90% of the nation's greenhouse gas emissions are from sheep. Not surprising when you discover the fact that New Zealand holds the current Guinness World Record for number of sheep owned by one man at almost 400,000!

One cannot write about sheep husbandry without mentioning the ethical issue associated with mulesing, which is an area of much contention. In the UK, the British Retail Consortium and its members have taken a tough stance against this practise, and in countries where it is commonly practised, such as Australia and South Africa, initiatives are in place to find alternatives.

## SOURCE 7 *continued*

**Water use:** Wool production uses significant amounts of water. Some suggestions estimate that over a million litres of water are required to manufacture one metric tonne of wool. From a water intensity perspective, Sustainable Apparel Coalition's Higg Index considers the water intensity associated with wool to be only slightly better than cotton, which is an incredibly thirsty crop. The Index places wool quite a bit behind silk and polyester fabrics, which use little water in production.

**Chemical use:** Greenpeace's report Toxic Threads lists brands accused of using hazardous chemicals in high street fashion while The Higg Index has recognised the importance of chemical use and uses a number of indicators to assess its impact, such as carcinogenicity.

Wool does not score well on this front – silk and hemp fabrics and leather from grass-fed cattle all do better. In fact of all the 44 materials listed in the Index, it is the fifth worst in terms of overall chemical impact, being slightly less toxic than leather (corn-fed). This may be down to the use of chrome dyes. By working with suppliers, manufacturers and brands can significantly reduce the impact and toxicity associated with the production of wool garments and non-apparel.

Let's embrace the return to wool, but let's also ensure better farming practices (both environmentally and ethically) and use fewer chemicals in processing so that wool becomes truly sustainable. By understanding where to reduce and make change, hopefully decisions on wool sourcing can become a little less woolly, and we can enjoy this comforting fabric without any guilt.