

BIOREGIONAL RESILIENCE THROUGH BAST FIBRES

Exploring machinery
and methods to support
UK fibre production



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Zoe Gilbertson, Fellowship year 2023



“Clothing has the potential to make connections to land and people past and present, once the stories bound up in the creation of cloth come alive. The true values of production will be found in collaboration, local pride, ecological resilience and fair farming practice.”





Executive Summary

Clothing has the potential to make connections to land and people past and present, once the stories bound up in the creation of cloth come alive. The true values of production will be found in collaboration, local pride, ecological resilience and fair farming practice.

With an underlying aim to support bioregional resilience in the face of catastrophic climate change and biodiversity loss, this report explores the machinery and methods needed to progress a flax/hemp fibre system in the UK. It aims to provide guidance to those interested in bast fibres to start discussion around the land-use, scale, agronomy, machinery, governance, strategy and funding of flax and hemp ecosystems.

There is increasing demand for natural materials to replace energy-intensive, fossil-fuel-derived polluting materials. Food and building materials derived from hemp and flax are simpler to produce than textiles. A new system could begin with these to generate revenue for farmers, alongside developing collective skill in processing textile yarn. We could ask the purpose of making more textiles, considering if it's necessary when the world is awash with so much clothing. Textile fibre from flax and hemp could support other more useful products, such as food and building materials, which provide an excellent break crop in rotation, create monetary value, and connect people through culture. Starting from scratch, we have an opportunity to develop resilient, small-scale flexible systems that cope with the variable nature of the weather and work with seasons, nature, climate and people and not profit extraction.

We are not going to develop a new flax to linen system in the UK to compete with the existing global open market. It would take decades and investment of tens of millions of pounds to compete with existing European producers of hemp or flax for textiles and makes no sense economically or ecologically. All too often, textile businesses close due to tough economic situations and huge swathes of knowledge are lost. Tacit and embodied knowledge resides in people and is difficult to capture and keep. In the course of this research there were many conversations about the heartbreak of excellent local textile mills and spinners closing because the fashion business is so precarious. It would not be wise to recreate this situation. There are many other ways we could begin to work with the wonders of flax and hemp to flexibly structure enterprise and processes, and distribute value fairly, which do no harm to our environment or others.

We have an opportunity in the UK to develop our fledgling fibre systems using a new mindset and methods. We can create conditions of emergence for a democratic, cooperative, commons-based and ecological fibre farming culture. To achieve this, a huge variety of measures must be undertaken and many more will emerge as we get going.

Key findings

- Flax and hemp can support organic crop rotations whilst creating valuable and useful outputs. Hemp appears to be a fantastic break crop and its rotation is shorter than flax. It has the potential to clear stubborn weeds at the end of a rotation and can be easily managed in an organic system.
- Starting from zero with flax and hemp we must encourage the best agroecological practices. It is short-sighted to progress a conventional agricultural system that continues to ignore impacts on soil, biodiversity and people.
- Linen and hemp can be knit or woven to make wearable, beautiful clothing suitable for warm and cold environments. We are not lacking access to clothing but it will take the UK many years to develop expertise in making these textiles – so we should start now. Developing home grown textile systems will create resilience and less extractive systems.
- Flax and hemp, if encouraged, could support a wide range of material outputs, skills, livelihoods across the UK with many knock-on benefits for farming and society, reducing reliance on fossil-fuel materials.
- Farming hemp can provide multiple different products within a carefully designed supply network. The case for hemp and building materials is very clear as they're simple to process. Textiles also have great potential but will take more time, patience, knowledge and investment to develop. Cross sector planning for staged outputs, starting with food/building materials, while progressing to textiles, makes economic sense as textiles can ultimately bring more value to the system.
- Flax is easier for communities and smaller systems to grow and transform into textiles. It can create a wide range of useful products and creates finer textiles. Issues with weeds can make it more challenging than hemp to grow organically but it is possible, particularly within livestock rotations.
- Scales of processing machinery are viewed differently depending on context. Something considered small in France would be medium/large scale in the UK. 30-50 hectares of production per year appears a good place to start for a bioregional cooperative system. Less than one hectare per year is suitable for an artisan/maker community.
- There are many small groups in Europe exploring smaller scale production. Machinery is not place specific like cultivation. International collaboration is not easy but if like-minded collectives could progress the development of open-source machines together the benefits and costs can be shared.
- Community orientated processing locations are key. On farms, this could provide opportunities for small growers and community groups to use the machines, therefore connecting lab/community scale with farm scale. These relationships could support community cohesion; connecting urban with rural.
- Newly developing fibre and fashion systems should consider cooperative, commons-based models to encourage additional resilience and alignment with agroecological social practices. Established cooperatives can support other collectives, spreading new ways of working via grassroots rather than top-down implementation.

- The French are quickly transitioning to a system that includes an even distribution of both winter and spring hemp and flax; acknowledging that diversity in an uncertain climate is a resilient strategy. This has been championed by Lin et Chanvre Bio, an organisation it would be good to emulate.
- Weed management is the key consideration when growing flax at any scale. Suppression using carefully planned mixed livestock/arable rotations can work well. Growing flax in a no-till system, usually requires the extensive use of glyphosate which must be avoided. We can learn best practice from countries such as France and Canada with similar climates. Information is freely available online.
- Bioregional demonstration products that show the potential of local natural materials can serve as totems for communities and have much more value than is captured by price.
- The UK will need to develop its own networks and/or associations of support for agroecological bast fibres. Connecting this to wider European value-led networks for local to global collaboration.
- Flax and hemp have a wonderful ability to capture people's hearts and imaginations. Local fibre ecosystems will always be place-based and context driven. Every instance will be different depending on the history, land and culture of a region.
- Values-led entrepreneurial risk-takers, creative innovators and pioneers are incredibly important within any system. They should be supported and encouraged with incentives that allow for risk taking and experimentation without the need for extractive capital investment.
- Operating within linear supply chains without externalising costs is difficult. True 'sustainability' within the existing fashion system has high costs and people must come to terms with this. Small enterprise with the flexibility of size and personal relationships, can bring customers with them on a nature-led, transformative learning journey.



Recommendations

The following recommendations, progressed over the long-term, will build resilience in communities through bioregional natural material production and create a brighter, agroecological future. They are intended to support potential stakeholders of any new system.

For those interested in farming:

- Consider collaborating with French researchers and detailed translation of organic agronomy and research. Inter-disciplinary research with (organic) arable crop researchers studying the impacts of climate change and textile researchers is also advised.

For those interested in policy:

- Consider integrating fibre with food, farming and land-use initiatives and policy e.g. "Food and Fibre". This would include all animal by-products such as leather and wool alongside bast fibres such as hemp and flax.
- Push for legislation to allow easier growing of industrial hemp: a simple online registration system would easily remove some barriers to the cultivation of hemp.
- Re-think landuse for meat production to create space for producing materials to replace synthetic, carbon-heavy, fossil fuel derivatives and help hit carbon reduction targets.
- Consider incentives to support the creation of flax and hemp infrastructure, which align with education and governance that encourages collaboration and value distribution. This will support long term societal resilience.

For those interested in machinery:

- Consider sharing costs and collaboratively developing small regional scale machinery with European partners, open-sourcing plans will prove beneficial to many countries. Local to local markets do not compete. Co-designing with farmers and stakeholders must be a prerequisite.
- Concerted efforts to fund spinning infrastructure to suit the scale of any scutching infrastructure must be undertaken once the latter is established. A small scale spinning facility - situated in the South-West of England due to its wet and warm climate - in a maker space or University could be a good starting point.
- Further research could outline the small-scale processing machinery required for the by-products of fibre production and other uses for flax and hemp; for example, food processing equipment, insulation, felted growing mediums and building brick construction. These goods are much simpler to produce but practice-based knowledge is siloed into sectors and harder to access.

For those interested in the system:

- A collaborative cross-sector group could progress the small-scale, agroecological development of all bast fibre outputs.
- Funding will need to be found to support fibre meet-ups, conversations, knowledge exchange and on-farm learning visits specifically focused on fibre for textiles if this sector is to develop.
- An interdisciplinary project, could collaboratively map all potential opportunities and stakeholders for by-products of fibre hemp and flax across a wider ranging supply network beyond textiles.
- Inspired by the French, we must demand a 'Minister for the Ecological and Solidarity Transition' in the next government.
- Fibre-based agriculture could be funded through streams that currently support fashion. For example, diverting a percentage of the British Fashion Council Budget to Defra to acknowledge the importance of farming for a healthy fashion system.

For philanthropists and funders who want to help:

- Investment in small scale harvesting and processing machinery is vital to begin creating distributed flax and hemp eco-systems across the UK. This should be implemented through grants or patient finance. It does not require huge sums and can be supplemented with community fund-raising.
- A supportive bast-fibre culture could be seeded through small scale, community, arts, artisan and experimental initiatives. These should be supported to thrive through the network of Fibresheds and other community/arts initiatives, linking farm and community.
- Funding exemplar 'fashion farms' and bioregional demonstration products that hold stories and communicate the magic, culture and potential of place based projects will support the overall aim of reinstating a bast fibre culture.

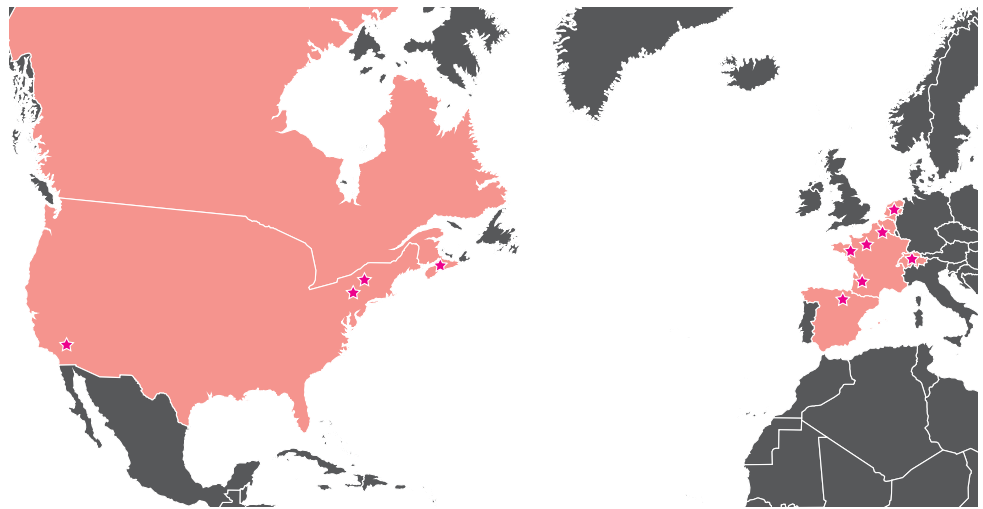
For those interested in education:

- Technical expertise in scutching and spinning could be supported to develop through vocational education programmes. Curricula involving the growing and processing of bast-fibres and other textiles by hand or using/developing small scale machinery could be introduced in technical colleges. This will demonstrate the time and difficulties involved in creating products we take for granted and introduce new perspectives.
- Some UK Universities are introducing seed to cloth education on fashion and textile courses but it is not the norm to explore the realities of where our clothing comes from. This approach must be broadened and introduced into primary and secondary schools.

And finally....

We need to understand our context, learn from the past and learn from others if we are to revive an industry that has clearly always had difficulties surviving in the UK. Decolonising our material production through developing place-based, non-extractive supply networks requires blending old and new technologies, restoring long forgotten processes, and sharing knowledge and learnings from many places.

For the curious and engaged, this will be an exciting journey...



This map shows where research was conducted in-person in Europe and online in North America. We hope many more many destinations will be added in future.

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About the Author



*Zoe Gilbertson is a fashion ecologist and textile systems designer. Using this lens plus previous experience of the fashion industry, she explores how livelihoods focusing on collaboration, the commons, ecology and bioregionalism could support a new fibre and textile economy in the UK. Zoe founded a not-for-profit company called **Liflad CIC** and the **Bast Fibre Network** to progress these aims.*

If you are interested in discussing any of the recommendations or points made in this report please get in touch via: www.liflad.co.uk or connect via: <https://www.linkedin.com/in/zoegilbertson/>