Community-Led Textile Resilience through Collaborative Networks and Open-Access Tools

1. Background

The production of textiles has become increasingly globalized, with long and opaque supply chains contributing to environmental degradation and labour exploitation. Overproduction due to high-volume fast-fashion cycles burden land-fill sites and compounded by the now dominating use of synthetic fibres add significantly to environmental pollution. Grassroots movements like the Fibreshed movement and The Transition network advocate empowering regional textile communities, the use of local biodegradable materials, ethical labour, and regenerative agricultural practices instead of synthetic or imported fibres and textiles.

In 2023, inspired by the Fibreshed ethos and previous "Grow Your Jeans" projects in the US[1] and the UK[2], Brigitte Kaltenbacher initiated "Let's Grow Flax" (LGF)[3], a community group in Southeast England with the aim of exploring a traditional local plant fibre, i.e. flax, to conserve and revive traditional textile skills but also to build up a network of local growers, artisans and micro production facilities to create bio-regionally produced linen yarn. As a practical outcome, the group aimed to create linen denim jeans as an alternative to standard cotton jeans as their production comes with a dire environmental cost: the use of toxic dyes, excessive water use, and harmful chemicals. Last year, 70 million pairs of jeans were sold in the UK alone.[4]

In 2024, the collaboration between LGF, local artisan Brigitte Kaltenbacher and the Fantasy Fibre Mill, one pair of jeans was produced, with all materials produced and sourced within 50 miles of the project base at the Surrey Hampshire border. This case study illustrates how community-driven grassroots movements can drive positive change but also illustrates pointers for future exploration.

2. Aims

The project aimed to explore how to build textile resilience in local communities by

- **Re-skilling:** Teaching locals how to grow flax in their own gardens, allotments and even plant pots, including how to process flax into fibre.
- **Skill conservation:** Conserve traditional local textile skills like plant fibre production, and spinning, naturally dyeing and weaving it into textile products and small pieces do textile art.
- **Open Source tools:** Expand local community flax fibre processing capacities by using open-source and DIY tools, and public outreach event to share knowledge freely.
- **Community driven:** Foster collaborations between growers, textile artisans, makerspaces, woodworkers, and the Fantasy Fibre micro-mills to create a bio- regional textile network.
- **Regenerative**: Produce a locally created garment that acts as a viable prototype for a locally made version of a fashion staple, yet at a fraction of the environmental impact.

3. Approach:

Community based Flax Cultivation and Processing (2023)

- **De-centralised Community cultivation**: In 2023, thirty participants grew one to two square meters of flax in gardens, allotments, and even flowerpots. Participants received online training on sowing, harvesting, and retting flax to extract usable fibres. Each

participant donated 2/3rd of their crop to the collaboration with the micro flax mill and kept one third to learn and improve their individual textile skills. Participants came from a variety of backgrounds such as garden and allotment growers, textile artists and tutors, 'green' parents, horticulturalists, and other craft groups.

- **Traditional and adaptive DIY Processing skills**: The group processed their flax using a mix of traditional tools and open-source DIY tools[5] like flax brakes, hackles, and combes. Designs were based on historical plans but also adapted for ease of replication and domestic community use. The DIY flax brake was reduced in size for ease of storage, but also so that off-cuts could be utilised, both for wood waste reduction and a low budget impact. Everyday items like plaster brushes and dog combs were adapted too and perfectly adequate for small scale processing like 1-2 SQM flax patches. The flax growing community also reached also into the wider community of wood workers (wood turners, men-in-shed, re-skilling centres and maker spaces) to have tools made.
- **Community open days and public flax processing workshops** held in craft oriented and historical open-air museums benefited knowledge sharing between the group members and also the visiting public, including children. All demonstrations and workshops engaged the public hands-on, everybody got to process flax and make cordage to take home.

Linen Denim Garment Production (2024)

- **Collaboration with Fantasy Fibre Mill** (FFM)[6]: Initially two thirds of the communally grown flax fibre was given to the FFM micro-mill to be spun into linen yarn for the warp, using open-source machinery adapted from related textile processes:
    - The flax brake was developed based on open plans for a rotary hemp break, shared by Fibreshed US (2016). [7]
    - The rotary scutcher is based on designs shared by Somin Cooper, Flaxland UK[8].
    - The flax ring spinner is adapted from an open access wool spinner by Studio Hilo, Berlin, and designed to facilitate mobile and bio-regional production[9].
- **Handweaving and Dyeing**: Sustainable weaver Brigitte of BeeKayMakes[10] hand-spun the weft yarn, following 1-2-1 tuition by Amanda Hannaford[11], National Guild examiner for bast fibre spinning, with a focus on long line fibre spinning. She then dyed the yarn with oak gall and iron water dye, which creates a rich dark and durable colour. The weave construction followed the traditional jeans construction of a 1/3 twill, using an unbleached warp and a naturally dyed dark weft with a typical denim weight for jeans (about 350 GSM).
- **Sewing and Finishing**: Fibreshed member Nick Evans[12] tailored the jeans in London, incorporating design features and elements that prioritized sustainability, such as oak wood buttons instead of metal zips, extra seams to replace rivets, and biodegradable sewing thread, dyed with onion peels to produce a strong yellow, consistent with traditional jeans design. A genderless pattern design was adapted to feature size inclusive features, and a seam technology that allows owners to adjust the size themselves, should they wish to do so. Yet, high end features were also included like selvedge use on the coin pockets, fly detailing and a pattern mix in the cloth. Lastly, the back pockets utilised the linen denim off-cuts, reducing the cutting waste to 5%.

4. Results

- **The LGF growers** produced communally 10GK of flax straw, 2 KG of Flax fibre, 1.2 KG of yarn (both line and tow yarn), a result comparable to commercial figures, a fantastic result for a group of largely first-time growers (www.flaxland.co.uk/processing).
- **Yarn production:**
  The warp yarn was initially intended to be spun by the FFM, to a spec that would match a standard cotton denim specification. While early yarn sample production showed great promise, scaling up to meet the full 900g warp requirement proved unfeasible within the timeframe. Ultimately, only about 130g of FFM-spun warp yarn was used in the jeans, with the remainder being hand-spun.
- **Jeans Production**: The tailor, Nick Evans of FirstPrincipals, an expert in denim and linen workwear, reported that the linen denim fabric could be sewn and transformed into jeans with several high-end features without any problems. The fabric behaviour of the linen denim cloth was completely comparable to a cotton denim fabric.
- **'Core exhibit' at the 'Fashion on Earth'**: The first pair of community-grown and locally made linen denim jeans were completed and showcased at the 'Fashion on Earth'[13] event in Bristol in 2024. The organisers presented the linen denim jeans the 'core exhibit' of the regenerative fashion show, due to its ethos and production processes.
- **Textile Community Resilience**: By developing and sharing skills, using productivity-enhancing open-access tools, and engaging with the wider craft community, the group and the mill demonstrated the feasibility of the production of a locally grown and made, 100% biodegradable fashion item within a 50-mile radius of the project base.
- **Knowledge Dissemination**: Over 50 individuals attended workshops, and online resources about flax processing were accessed widely by textile artisans and Fibreshed affiliates across the UK. Approximately 150 people of the public engaged in hands-on flax processing demos and workshops, comprising a wide range of age groups.
- **Replication Potential**: The approach and tools developed in the project are shared online with other flax growing initiatives like 1QM Lein (Austria & Germany) for the 2025 growing cycle. Initial feedback is promising.

5. Next steps:

- A potential problem regarding the retting of the community grown fibre was identified during spinning. Initially the yarn was dry spun. Once higher humidity was added to the spinning environment, it seemed that different bunches of the community grown fibre reacted differently to the humidity. This seemed to affect the drafting of the sliver.
- A small follow-up project in 2025 will evaluate this theory and test centralised retting as an alternative.
- The mill also aims to improve the yarn output and to achieve a yarn spec of 35 WPI (8 LEA) in 2025.

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For more information, visit www.letsgrowflax.org.uk or contact LetsGrowFlax@gmail.com.

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