# Crafting wellbeing: a dynamic collaboration between people, disciplines, and trees.

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## Introduction

Craft thinking allows the material dialogues that take place during the act of making to become methods of possibility-finding. It requires active reflexivity throughout that dialogue, with the willingness to let go of pre-conceived ideas, tools, or techniques in response to listening to what the materials want to say and to the negotiated and novel affordances that emerge (Groth and Nimkulrat 2025, Brinck 2025, Barati and Karana 2019). When repetitive practical tasks are performed – for example, stitching, weaving, knitting - the mind of the maker is able to travel laterally: to tentatively explore conversations with other knowledges and disciplines, glimpse further possibilities and dreams, and to fold these back in through a generative process that disregards traditional disciplinary boundaries (Brinck 2025).

This paper discusses the dynamics of this 'folding in' of diverse knowledges and peoples in a craft-led research project, through the work of the Barkcloth Research Network. It explains how a pragmatic, craft-led investigation into the potential of a radically indigenous, endangered textile for sustainable fashion has evolved into a multi-disciplinary research project with a team that currently comprises designers, farmers, artists, craftsmen, environmentalists, textile technologists and scientists in the UK, US and Uganda. The research demonstrates the potential of craft to assist in resolving complex, wicked problems and advances the role of craft-thinking in brokering new relationships and possibilities between people, disciplines and the more than human.

## Problem statements

A disconnect from the natural world has been exacerbated by population shifts to urban areas. This has enabled the systematic plunder and degradation of natural resources - unimpeded and even unnoticed by most of us. There has been an average decrease of 69% in global wildlife populations since 1970 (WWF 2022) and since 1990 global deforestation is already equivalent to the size of Libya (FAO 2020). In 1950, only 30% of the world's population lived in urban areas; today this has risen to 56% and is expected to grow significantly by 2050 (World Bank 2023, UN 2019). Land degradation is an existential threat to the human and more than human inhabitants of the Earth; some consequences of this disconnect from nature are all too clear:

a) Increasing levels of stress and anxiety in city populations may not only be linked to hectic lifestyles, changes to work-life balance, and by the technologies that distract and enthral us, but also to a disconnect from the restorative effects of the natural world (Bell and Ward Thompson, 2014; Grinde and Patel, 2009, Kellert et al, 2017, DEFRA 2024, UN 2019). In 2023, 60% of people in the UK reported experiencing anxiety, 76% stress, and 56% experienced depression (Pindar 2023). Research shows that there are substantial benefits to health and wellbeing gained from spending time in nature – it having a restorative effect on people suffering from a range of health disorders (Kellert et al. 2008, Bell and Ward Thompson 2014, Barbiero and Berto 2021, American Heart Association 2024). Calm is improved and blood pressure decreased merely by touching the leaves and the bark of trees (Putra et al 2018). In addition, walking in forests enables phytoncides—chemicals released into the air by trees—to stimulate the immune system in ways that even prevent certain diseases (including cancer) from forming, as well as to improve our ability to manage stress (Putra et al 2018, Hansen et al 2017, Bell and Ward Thompson 2014, Grinde and Patel 2009).

b) Anti-microbial resistance is a major global concern, set to exceed cancer as the leading cause of mortality by 2050 (Butler et al 2020). It is estimated that between 7-10% of hospital patients will develop health care associated wound infections (HCAIs). Staphylococcus aureus (MRSA) is the most common cause of infection, and has become methicillin-resistant (Butler et al 2020). Most antimicrobial fabrics used in wound dressings employ metals and other synthetic compounds that are reliant on extractive processes and are, therefore, unsustainable. It is vital now to find effective, natural alternatives that might have intrinsic healing properties.

c) Soil biodiversity relates to all the living organisms in the soil that effectively function as a community to provide services that support plant and animal productivity. A complex network of micro-organisms is crucial to soil nutrient, energy and water recycling; to maintaining water quality; to decomposing inactive toxic materials as well as organic matter; and in extracting greenhouse gases from the atmosphere (Tahat et al 2020, Fahad et al 2022). However, soil health is deteriorating rapidly due to intensive human activities, including industrialised agriculture, with associated overuse of pesticides and fertiliser (European Environment Agency, 2023, FAO 2015, Tahat et al 2020). Switching to organic farming is a long and costly process, with farmers experiencing lower yields in the short term. Organic fertilisers are more expensive than synthetic fertilisers too, placing further financial burden on farmers that wish to transition to soil-friendly agriculture (Tahat et al 2020). It is vital now to find locally-specific, environmentally-sustainable, plant-based solutions to improving soil health and to learn from communities that manage this successfully.

These three, diverse but interconnected wicked problems share a potential solution that has emerged through interdisciplinary, craft-led research (Zimmerman et al, 2010): the mutuba tree (ficus natalensis), from which Ugandan barkcloth is made (Figure 1).

Fig 1. The mutuba tree (ficus natalensis).

Fig 2. Bazomazi Paul Bukenya harvesting bark

## The Barkcloth Research Network (BCRN)

The BCRN was founded in 2016, initially to explore the potential of Ugandan barkcloth as a sustainable, luxury, fashion textile. As a result of the potentialities that have emerged through craft practice, the network has grown organically, folding in new members and disciplines with richly diverse lenses, knowledges, technical and other expertise that contribute to an ongoing project that continues to reveal exciting new possibilities.

## Ugandan barkcloth

> These communities are the repositories of vast accumulations of traditional knowledge and experience that links humanity with its ancient origins. Their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems. (Brundtland, 1987: 114-5)

Barkcloth, or *lubugo* in the Luganda language, has been produced from the mutuba tree by the Baganda people of southern Uganda since at least the 13th century. It has been designated part of the Intangible Cultural Heritage of Humanity by UNESCO since 2005 (UNESCO 2005), and represents an entirely sustainable, traditional ecological knowledge (TEK) system where skilled craftsmen work in close collaboration with trees, with knowledge passed down through generations (Figure 2). It is made from the inner bark of the mutuba tree, which may be carefully harvested annually for at least fifty years without damage to the tree; the bark is softened in boiling water or steam, beaten by a series of ridged wooden mallets until the fibres almost felt as it grows dramatically in size to form a large, relatively soft and pliant sheet (Scott et al 2023, Venkatraman and Scott 2018, Figure 3). It is laid on the grass to dry, anchored by stones, and develops a natural, rich, rust colour. These processes demonstrate utmost respect for the trees, which are tended with great care: checked before harvesting, that their bark is willing to be taken, in the rainy season when they are less likely to be damaged; a sharpened wedge of a banana tree branch is used to prise the inner bark away from the trunk - just strong enough, but also gentle enough, not to hurt the tree - before wrapping the trunk with banana leaves for a day or two while it stabilises - preventing infection and allowing a new bark to begin to grow. The barkcloth processors of Bukomansimbi are living repositories of TEK that demonstrates how to sustainably collaborate with nature (Brundtland 1987).

Barkcloth is symbolic of Baganda cultural identity, having historically been worn at the Bugandan court as a signifier of status, and was an important item of regional trade before imported woven cotton fabrics were introduced in the mid-nineteenth century (Nakazibwe 2005, Venkatraman and Scott 2018). Today, sheets of barkcloth are still knotted over contemporary clothing for ceremonies, worn by the Kabaka of Buganda kingdom, and by political leaders as a signifier of their culture and tribal affinities. However, it is rarely used in clothing today and more frequently appears as burial shrouds because of its anti-bacterial properties – in fact for some, it has become closely associated with death, ritual, or tourist craft. Barkcloth production is endangered due to this declining market and therefore few young people see a future for themselves as bakomazi (barkcloth processers) that might motivate them to stay in their villages and learn this ancient craft. An important mission of the BCRN has been to assist in preserving and promoting this indigenous knowledge system as part of the future heritage of humanity (not as relegated to the past), as it holds clues to

how we might live better on the Earth. All knowledge generated from the research is made public and shared back with its community, using a model that the team call Borrowed Cloth: borrowing the cloth, never forgetting who it really belongs to, and returning this knowledge as interest on the loan (Scott 2020). The research in the UK and US has evolved in consultation with key team members in Uganda, and with sensitivity to the enduring legacies of problematic and exploitative colonial histories.

## Research methods and results

To investigate the potential of a barkcloth for sustainable luxury fashion, and the subsequent aims that organically have arisen, a highly agile and pragmatic research approach has been used, unfettered by rigid methodology nor bound by conventional timeframes. The research is generative and therefore open-ended, as more possibilities continue to emerge. Qualitative research methods began by thinking through a series of design and making processes (Ingold, 2013). These were supported by field research in Uganda, which included interviews, observation, documentation, filming, photography and listening. Interviews with farmers provided insights into the rich benefits of local integrated farming practices. Interviews with barkcloth processors detailed their collaboration with the mutuba trees and the histories, development and the significance to them of their craft practice. Quantitative experimentation in a textile technology laboratory and a microbiology laboratory at Manchester Metropolitan University defined and measured the mechanical qualities of barkcloth and its unique antimicrobial propensities with startling results (Butler et al, 2020). Each team member brings a different perspective to the project, which are here characterised as lenses.

### Different lenses

Kirsten Scott (designer-maker-researcher in fashion and textile systems, and fibres, and Head of Research at Istituto Marangoni London) first began by playing with barkcloth, listening to what it had to say, what it might be persuaded to say, and then expanding and refining this through a series of experiments, samples, sketches, maquettes and garments. Some of the processes were repetitive and even meditative in nature - for example, cutting and stitching fine strips of barkcloth onto a curved barkcloth shape, in ways that emphasised its sculptural form while simultaneously strengthening a garment body (Figure 4). This lengthy process allowed her mind to wander, to consider the ways that curved shapes can reflect or be abstracted from forms found in nature, the potential psychological benefits of this (Kellert et al 2017), and then the possibilities to exaggerate these curves in ways that improved the functionality and distinctive aesthetics of the garments (Figure 4). For example, through excess fabric across pressure-points such as the upper back, or at the elbows, bottom or knees. This conversation with the cloth, therefore, evolved a design strategy that drew on biophilic and biomechanical design theory, crossing disciplinary boundaries and dipping into other knowledges as the cloth directed, to work with the limitations and opportunities that the cloth afforded rather than imposing a pre-determined design upon it. A fluid interchange between practice and theory developed: practice suggesting reading and reading suggesting practice. In this way, a series of luxury garments were made in barkcloth that aimed to demonstrate its value in contemporary luxury fashion. Although some initial design ideas were sketched out, or modelled on a mannequin to start with, the process of making redirected these designs and the scope of the research itself, leading to a

reconceptualization of luxury today as rooted in an ability to promote the wellbeing of peoples and planet (Scott et al 2023, Scott 2020). In addition to developing a materials-led, biophilic design strategy for clothing, her research suggests that actually wearing barkcloth may deliver benefits to wellbeing, a hypothesis to be tested in clinical trials: if just touching the bark of trees reduces stress (Putra et al 2018), how much more might wearing it?

Fig 3. Thinking through making, taking on board the results of strength tests, in the development of a biomechanical and biophilic design strategy.

Fig 4. Paul Bukenya with processed barkcloth in its natural colour

Fig 5. Barkcloth jacket using biophilic and biomechanical design strategy, dyed with indigo.

It was felt that the natural rich, rust colour of barkcloth was limiting (Figure 4), so it was important to sustainably develop alternative colours that could be dyed over this – in particular black, as a useful colour in luxury fashion. Karen Spurgin (embroiderer, natural-dye researcher, co-founder of ao textiles, and Senior Lecturer in Textiles at Istituto Marangoni London) explored natural dyes for and from barkcloth. Karen first investigated some traditional Chinese textiles, such as Liang Chou Silk and the shiny silk of the Miao people, to experiment with different surfaces and coatings for barkcloth. Eventually, drawing on medieval tempera recipes, by using egg white and logwood, she created a natural, lustrous, black coating that improves water-resistance and is entirely compostable (Figure 6). However, it was through these experiments that other possibilities emerged - as Karen discovered that barkcloth yields a pigment of its own, that could be used to dye other materials. She was able to extract pigment from barkcloth scraps so that nothing was wasted, in a series of experiments that established the optimal strength of dye solution and the most effective mordants to offer a range of shades of brownish-pinks (Figure 7). Karen tested these in a sheer, layered, silk dress embroidered with threads that were also dyed with barkcloth (Figure 8). As the team began to explore barkcloth's antibacterial properties, Karen was prompted to research Ayruvastra, a 5000-year-old Indian tradition where textiles are used to impart health benefits to the wearer, through the skin, by dyeing them with plants that have specific healing properties (Thakker 2020). This research has potential in bespoke luxury fashion for wellbeing, as well as in sportswear, children's clothing, bedding and in medical use (Scott et al 2023).

Fig 6. Logwood glair coating for barkcloth


Fig 7. Silk crepeline and threads dyed with barkcloth scraps

Fig 8. Embroidered silk crepeline dress – all dyed with barkcloth scraps.

Early in the project, Prabhuraj Venkatraman (Senior Lecturer in Textile Technology at Manchester Fashion Institute) joined the BCRN. He identified that barkcloth's natural and relatively unmediated origin means that its rather coarse, irregular fibre strands can lead to inconsistent densities in a sheet of cloth. Fabric tests were undertaken at Manchester Fashion Institute to assess its performance – including fabric drape, stiffness, surface morphology and tensile strength (Figure 9). The results revealed that it had a stiff texture and poor strength, which are challenges to be overcome. The barkcloth was also subjected to CO2 laser patterning and sublimation printing to incorporate surface patterns and fused with various interfacing fabrics to reduce its stiffness, enhance drape, and increase strength (although these were not sustainable choices). A size 12 female full-sleeve top was developed with the fused barkcloth that offered good drape and its shape and fit were evaluated on a mannequin. Based on these evaluations, he concluded that barkcloth could be developed into further outer garments, but it seems likely that barkcloth - in its natural form - is not viable for use in industrially-produced clothing. However, the luxury sector contains niche areas where connoisseur customers place value on unique, slow craft processes, sustainability and the heritage– and are therefore more open to the non-uniform and distinctive qualities that this indigenous textile offers and the conventional demand for scalability does not apply. Further research is planned with consumers to evaluate barkcloth-based garments for aesthetics, comfort, fit and tactile sensation (Venkatraman et al., 2020). Prabhuraj contributes a scientific approach to the research, that employs rigorous testing to assess the commercial viability of fabrics, which provides useful quality benchmarks. His work highlights some of the technical challenges as well as the opportunities of using barkcloth in clothing, that informed Kirsten's use of stitched strips to strengthen barkcloth garments.

Fig 9. Burst tests at MMU textiles laboratory, to measure barkcloth's strength.

As indicated above, as the project unfolded, interviews with members of the BOTFA community revealed that barkcloth has anti-bacterial properties and thus used to wrap wounds and also bodies for burial. Although this knowledge is widely held in Bukomansimbi, and applied in local first aid treatments, it had not yet been tested in a university laboratory, nor had any test results been peer-reviewed. As Karen had begun to research Ayurvastra for her barkcloth dye experiments, Jonathan Butler (Senior Lecturer in Microbiology at Manchester Metropolitan University) joined the BCRN to investigate and determine whether barkcloth might combat bacterial infections such as MRSA. Initially sceptical, he was impressed by the results of his tests - where a 99 per cent reduction in bacterial viability after four hours was observed when barkcloth was exposed to MRSA; after 24 hours, this increased to a 99.99999 per cent (seven-log) reduction in bacterial viability (Butler et al. 2020, Figure 10). Jonathan's research suggests that the barkcloth causes morphological changes in the bacterial cellular ultrastructure after contact exposure to the fabric material. It was further observed that MRSA cells became irregular in shape, with invaginations, holes and perforations and there was also evidence of extracellular cytoplasmic leakage (Butler et al. 2020, Scott et al 2023), which caused the antimicrobial effect. The active anti-microbial compound/s in barkcloth remain to be identified and this is a current focus of Jonathan's research, but it appears that barkcloth has the potential to be used in wound dressing technology, due to its good porosity, identified by Prabhu (Venkatraman et al. 2020), antimicrobial activity, mechanical protection, environmental sustainability and cost effectiveness, which may expand opportunities for the Bukomansimbi community.

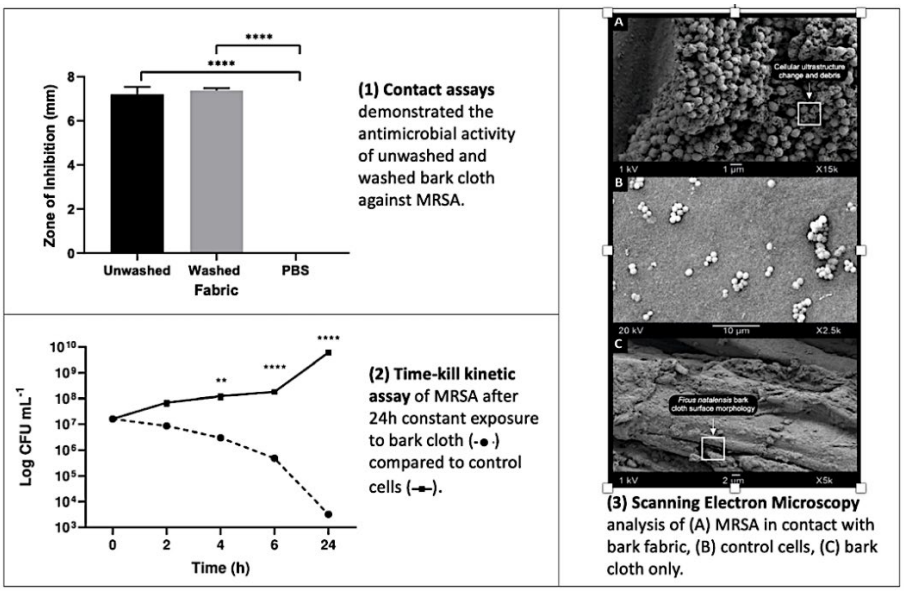


Fig 10. The results of contact assays that revealed barkcloth's ability to kill MRSA.

The Bukomansimbi Organic Tree Farmers Association (BOTFA) was founded by artist, Fulbright scholar and environmentalist Fred Mutebi. Fred grew up in rural Masaka, in southern Uganda, but has travelled extensively – receiving a Fulbright scholarship and showing his art all over the world. His revival of wood-cut printing in Uganda, and the work itself, reflects his processing of the social, political and environmental changes that he has witnessed in Uganda over the years, as the country recovered from civil wars. His artistic practice activates memories of his childhood and then folds in his dreams about contemporary social realities to inspire the composition of prints that advocate for social and environmental justice (Figure 11). In recent years, he has been painting on barkcloth canvases and developing paper from barkcloth. His environmental work promotes the revitalisation of indigenous trees and barkcloth processing as central to community regeneration in Bukomansimbi.

Fig 11. Rich Harvest, woodcut print by Fred Mutebi

Fig 12. Indigenous tree nursery in Bukomansimbi

BOTFA is managed by farmer and community mobiliser Stephen Kamya, and comprises local farmers who use traditional agroforestry methods to manage a variety of food crops. Its regenerative farming practices include a nursery and planting programme for mutuba trees and other indigenous species to combat deforestation and climate change in the region (Figure 12). In addition, BOTFA trains the local youth in skills that may support their sustainable livelihoods, reinvigorate their communities, and prevent an exodus to urban areas where young people can end up in squalor, and delivers workshops for schoolchildren to foster environmental stewardship (Figure 13).

Interviews with BOTFA members, conducted by Kirsten Scott in 2019, mediated by Fred Mutebi, revealed that the mutuba tree naturally improves soil health and stability, and thus crop yield. The mutuba tree is vital to providing shade for food crops such as yams, coffee, and banana, as well as every part of the tree carrying medicinal properties – in addition to supplying barkcloth. Ninth generation barkcloth-processors shared that for hundreds of years their families had grown mutuba trees and they had always kept their land fertile, delivering nutrients to the soil and demanding little water. This is in stark contrast to the non-indigenous eucalyptus trees that have become ubiquitous in some areas of Uganda, draining the soil of nutrients and moisture across large areas and impoverishing nearby crops. The interviews underlined the importance of locally-specific agroforestry in providing vital ecosystem services: including enhancing soil health and fertility, regulating moisture, binding soil particles, preventing soil runoffs and erosion – all of which are crucial to regenerating depleted agricultural land for sustainable food production, in addition to mitigating climate change (Fahad et al 2022). Bioregional agroforestry is gaining popularity in the global North, but has always successfully been practices by many indigenous communities in the global North; this research confirmed its enduring value to the community of Bukomansimbi.

Fig 13. Agroforestry training by BOTFA.

Lesli Robertson (textile artist, consultant and researcher, with the Smithsonian Centre for Folklife and Cultural Heritage, and founder of Mekeka Designs) has worked closely with Fred Mutebi for amny years, and with BOTFA since its inception, and now employs her expertise as a weaver and natural dyer to offer custom design services that use barkcloth and other Ugandan plant fibres in novel ways for a range of contemporary items that include accessories, interior installations and products, and even architecture. Barkcloth strips are woven with other natural fibres in Uganda to be used in mats, cushion covers and other interior products, while commissions have come in from major technology firms and other organisations. A recent collaboration between Mekeka Designs, Yale Center for Ecosystems and Architecture (Yale CEA 2024), and textile designer Rowland Ricketts extended the possibilities for barkcloth in sound-absorbent woven barkcloth and cotton wall coverings. Lesli draws on craft thinking are well as entrepreneurial acumen to work intuitively with the materials, uncover new ways of using them and testing their commercial viability in the market. Lesli established a tree adoption programme with Fred Mutebi and BOTFA, that incentivises mutuba tree growing in Bukomansimbi: farmers receive welcome extra income and adopters are given the geolocation for each tree, the name of the specific type of mutuba, its age, and the name of its barkcloth harvester – which provides traceability in any products they purchase.

Fig 14. Mats incorporating woven strips of barkcloth. Mekeka Design, 2024

Fig 15. Barkcloth incorporated in wall coverings in a collaboration with Yale CEA and Rowland Ricketts.

## Discussion and Contribution

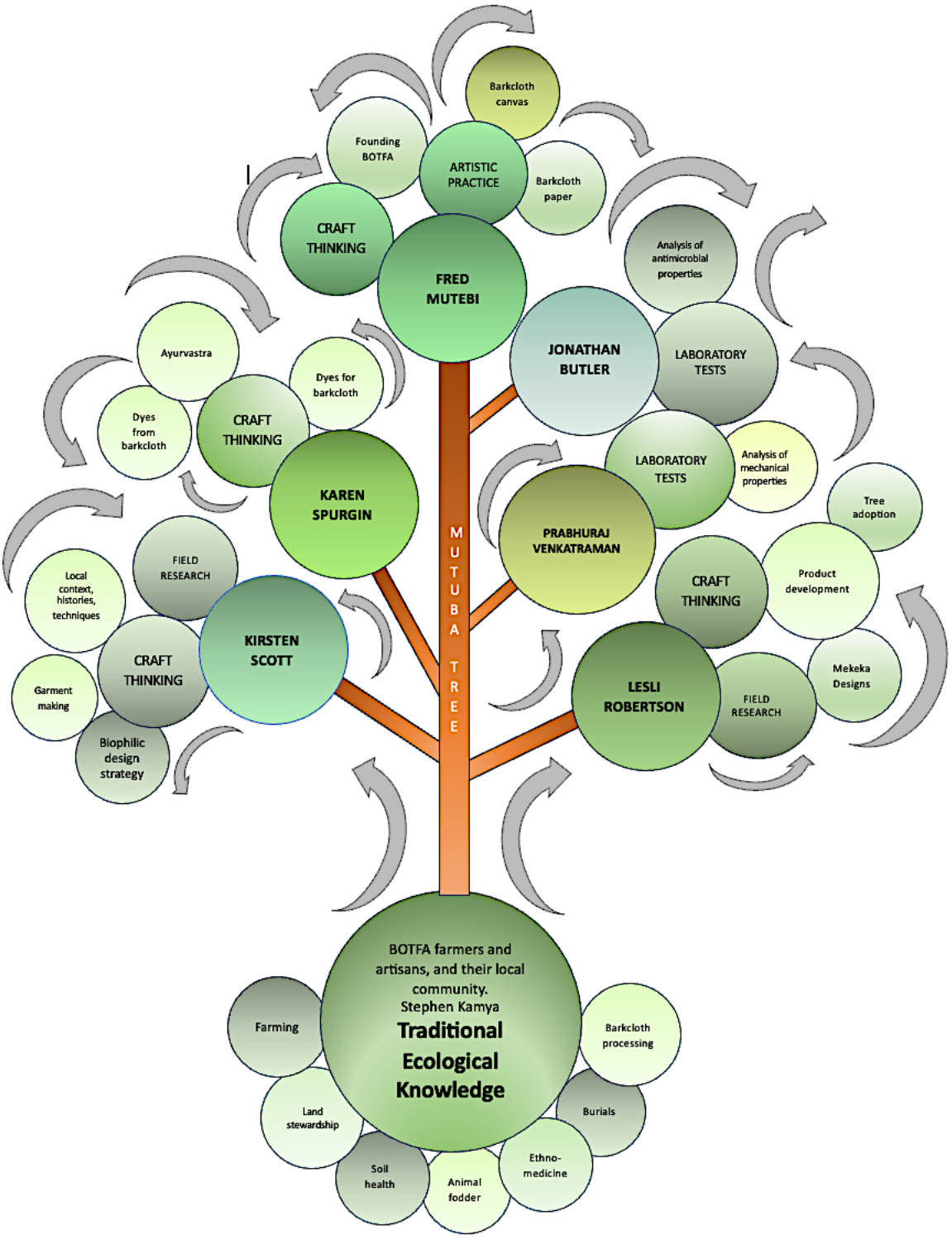


Fig 16. Barkcloth Research Network team members, methods, flows and outcomes

This research demonstrates the potential of craft to assist in resolving complex, wicked problems and advances the role of craft-thinking in brokering new relationships and possibilities between people, disciplines and trees (Figure 16). It demonstrates the role of

craft practice in driving the formation of an agile, multi-disciplinary network with the potential to contribute unanticipated solutions to global challenges. Craft thinking has instigated and propelled this research, in listening to and responding to what the barkcloth has told the researchers – both practically and conceptually. It offers a fluid, agile and reflexive method of possibility-finding, testing, expanding and refining. The more intuitive, serendipitous, materials-led research of the designer-makers and artists in the team has been complimented by the very different, more structured lenses offered by the scientists, and by the TEK of local actors in Bukomansimbi, as each has folded in to the project (Figure 16). The research evolved organically to focus on the wellbeing of people, through biophilic design strategies and the prospective benefits of wearing barkcloth, or clothing dyed with barkcloth; and the potential of barkcloth in combatting methicillin-resistant wound infections. It advocates for the wellbeing of our planet by amplifying the role of local agroforestry systems in promoting soil health – in this case the mutuba tree in Bukomansimbi. This investigation of barkcloth advocates for the urgency of re-examining (not extracting!) TEK systems that embody centuries or millennia of experiential knowledge. There is no place for disciplinary or geographical boundaries, if we are to find solutions to the wicked problems that confront us.

The mutuba tree nourishes soil, provides shade for food crops, fodder for livestock, multiple and diverse medicinal benefits, is locally known to be mosquito repellent, sustainably provides barkcloth for clothing and accessories, interior products such as screens or drapes, and effective wound dressings, helps to combat climate change, and supports cultural resilience in Uganda. If just one tree can deliver so many benefits to people and planet, how much more might a whole forest provide?

**Next steps**

Further testing will take place to measure the effectiveness of different sub-species of ficus natalensis in treating wound infections, the active compounds identified, and their Luganda names matched to their Latin names where possible. Fabrics dyed with barkcloth will be tested for anti-microbial properties too. Clinical trials will be conducted to measure any benefits to the wellbeing of people from wearing barkcloth. Experiments will be made to find ways of retting, spinning, weaving and knitting barkcloth fibre, to discover more ways of using barkcloth in clothing.

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