



# THE FIBERS ROADMAP

Integrated Capital Opportunities  
to Support Revitalization of  
U.S.-Grown Fiber, Textiles,  
and Leather

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**SUSTAINABLE AGRICULTURE  
and FOOD SYSTEMS FUNDERS**

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As Covid-19 reveals the vulnerabilities of U.S. supply chains, funders, impact investors, and integrated capital practitioners currently have the opportunity to apply lessons from the food movement and innovative financing models from several fields to catalyze momentum and reform in the U.S. fiber and textile industry. Experiences from the food movement show that a coordinated, strategic roadmap is critical to make the best use of integrated philanthropic and investment support.

This research project drew on more than 60 interviews with four groups of stakeholders across the U.S.:

1. fiber farmers and ranchers
2. processing businesses along the supply chain (mills, tanneries, etc.)
3. brands and other supply chain experts
4. funders and investors.

Findings from these interviews have been synthesized and distilled into a seven-year financial Roadmap identifying five key Gaps and Levers where integrated philanthropic and investment capital would have the greatest impact in rebuilding the “missing middle” of the supply chain. Each section of this high-level summary will be backed by additional data and findings for those interested in accessing more detail.



# BACKGROUND

Of all the symbols of our new world, perhaps none is as potent as the face mask. The mask not only represents a new daily reality and political landscape, but it is the most visible manifestation of a system we paid little attention to before: the global industry that brings fiber and textile products of all kinds to us.

Like food, fiber crops—including both plant-based fibers like cotton, hemp, and flax and animal-based products like wool, alpaca, and leather—are part of an interconnected agricultural system with linked impacts on health, social justice, and the environment. If we dig deeper, we find that the textile industry is also a key root of both our globalized, pandemic-enabling economy and the enduring racial inequities it has created in America. As Matthew Desmond writes in the 1619 Project, by the 1830s U.S. cotton plantation masters and mill owners had linked enslaved labor in the South with exploited labor in the North in what one politician of the time called an “unhallowed alliance between the lords of the lash and the lords of the loom.” In the process, Desmond writes, “they were fashioning a capitalist economy.”<sup>1</sup> Tracing the impacts of this model to the present day, Ayesha Barenblat and Aditi Mayer of the non-profit Remake write, “In today’s neoliberal deregulated global economy, developing countries are competing to produce for brands as much as they can, as cheap they can and as fast as they can.”<sup>2</sup> The industry has sought out these countries because they are “the cheapest frontiers left to exploit black and brown bodies.”<sup>3</sup>

Well before the Covid-19 crisis and the most recent wave of racial justice protests threw these linked issues into stark relief, a growing U.S. movement for more just and sustainable textile production was already at work on the ground. This growing movement for structural change calls into question the unsustainable apparel brand business model that relies on selling more products to more people each year—what the World Resource Institute calls the

“Elephant in the Boardroom.”<sup>4</sup> One major approach to these structural issues is to rebuild and revitalize U.S. fiber production and processing, known as “reshoring.” To avoid replicating issues with the global system, a reshoring approach must prioritize equity and justice, create fair market systems that return value to farmers, and move toward the principles of Just Transition in local economic development. For this to occur, **capital must also move in fundamentally different ways, so that we are not fruitlessly attempting to create regenerative systems with extractive capital models.** As one investor interviewed for the Roadmap noted, “if we’re not shifting where the capital is going, we’re going to end up in the same places.”

The sustainable fibers movement shares many characteristics with the movement toward more just and sustainable food systems. Growing interest in regenerative agriculture, which draws on the wisdom of indigenous and traditional agricultural practices, holds major promise for fiber production as well, including connections to regenerative grazing for wool, alpaca, and leather; regenerative cropping practices for cotton, hemp, and flax; and use of agricultural crop residues or invasive species to redefine “waste” into a regenerative input. However, our literature review found that determining the specific soil carbon sequestration contribution of fiber crops and leather in regenerative systems will require additional research. Along the supply chain from “Dirt to Shirt,”<sup>5</sup> then, reconnecting to a soil-based fiber supply chain through U.S. reshoring offers both philanthropic funders and investors opportunities to develop a more transparent, just, and regenerative fiber and textile system.

[Access More: Industry Overview and the Case for Reshoring](#)



Rolls of suiting fabric at Joseph Abboud Manufacturing Corporation, New Bedford, Massachusetts

# MARKET RESEARCH

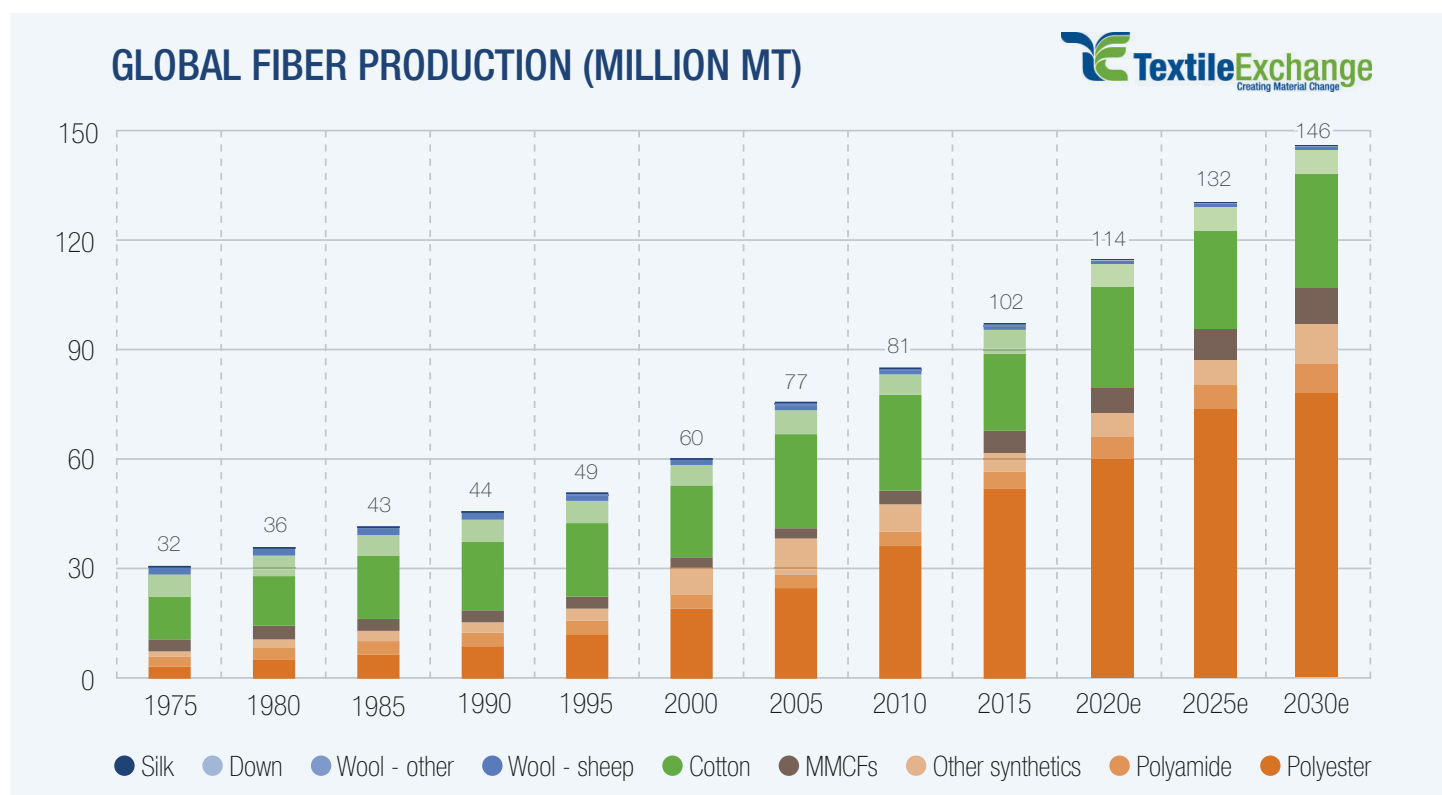
Based on a synthesis of several market research reports, the global textile and apparel industry currently has a value of around \$900 billion and is projected to grow to around \$1.2 trillion by between 2025-2027, with a compound annual growth rate (CAGR) of 4.3-4.4%. If the global leather products market is included, value estimates rise to \$1 trillion in 2018, projected to grow to \$1.6 trillion by 2022. For purposes of comparison, other research found that the global market for smartphones was \$522 billion in 2018, with a decline of 3% from the previous year,<sup>6</sup> while the global food and grocery retail market was projected at \$12.24 trillion for 2020.<sup>7</sup>

Textile Exchange's market data also show that this growth is driven by the rise in synthetic fibers

(polyester, nylon, and other synthetics). These fibers now make up over 62% of global fiber production. **In other words, nearly two-thirds of all the fibers we wear and use are made from oil.**<sup>8</sup>

Recent market research finds that the global market for “eco-fibers” is projected to grow from \$40.38 billion in 2020 to \$58.29 billion by 2027, growing at 4.6% CAGR over the forecast period, higher than the overall textile industry CAGR.<sup>9</sup> Such research also finds a very favorable opportunity assessment for the U.S., reflecting the intersection of market revenue size with the projected CAGR for eco-fibers.<sup>10</sup>

[Access More: Market Research](#)

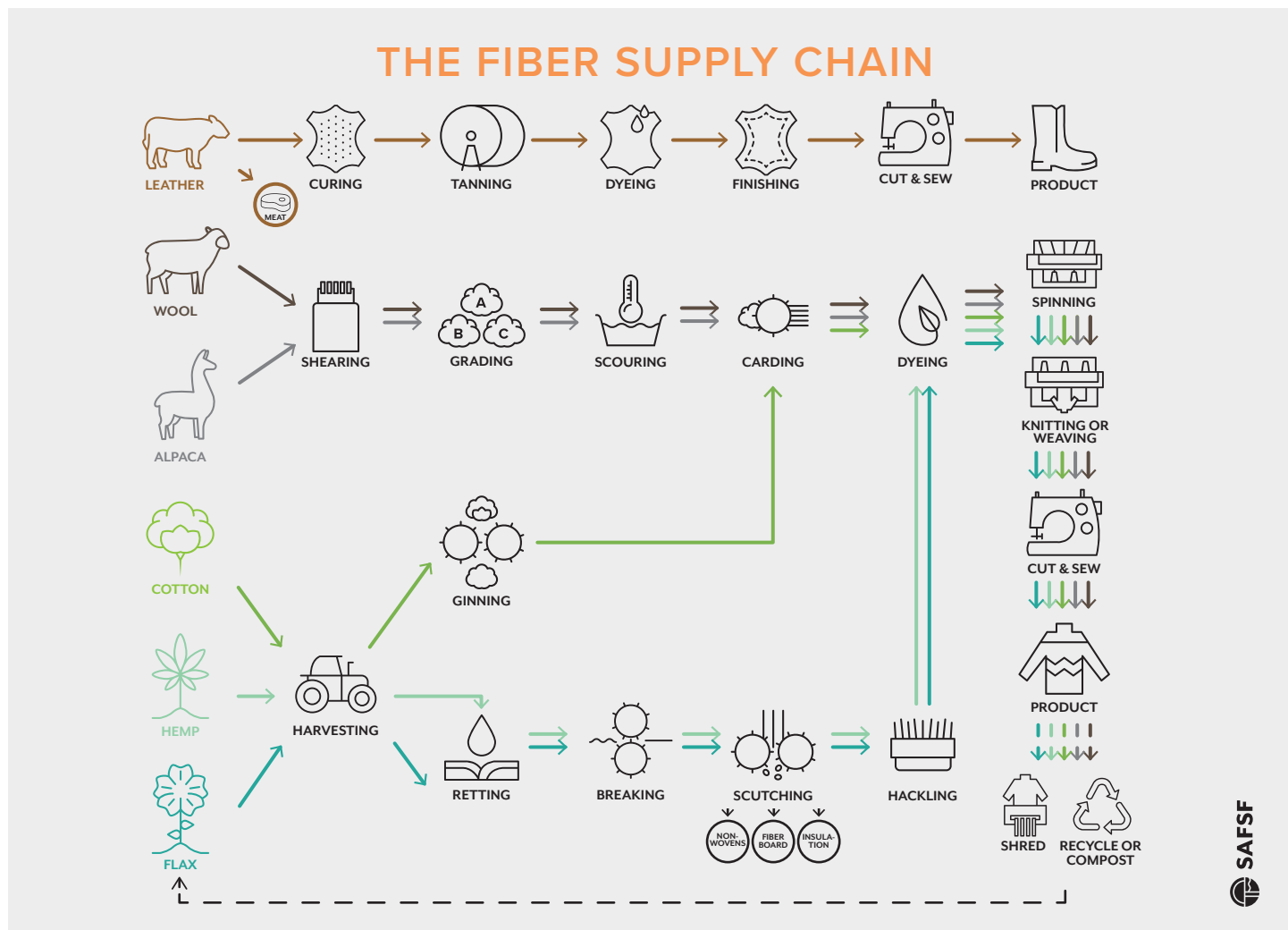


Global Fiber Production Projected to 2030. Source: Textile Exchange Preferred Fiber and Materials Market Report 2020.

# UNDERSTANDING THE SUPPLY CHAIN

In project interviews, we repeatedly heard that lack of understanding of the textile supply chain was a barrier to funding and financing. To demystify this system, the fiber supply chain graphic below summarizes the processing chain for each of the five major U.S. natural fiber crops and leather, as well as indicating entry points for natural dyes and textiles made from “waste” (meaning either unwanted textiles or agricultural crop residues).

Along this chain, interviewees repeatedly described U.S. infrastructure as fragmented and fragile, especially in the “missing middle” of mid-scale, regional production and processing. The current state of infrastructure for each crop, key industry considerations and analogs, and emerging examples of reshored U.S. supply chains are explored in greater detail in our full supply chain research.





Weaving loom, photo by Kathryn Huston, courtesy of Huston Textile Company, Mather, California

### Existing Infrastructure:

- **Wool:** Legacy U.S. industry with weak links at the shearing, testing, and scouring stages; ranchers need options to profit from all grades of wool.
- **Alpaca:** A relatively centralized supply chain and the critical role of the national processor New England Alpaca Fiber Pool offer key opportunities for modernization.
- **Leather:** Lack of U.S. tanning capacity presents a food-fiber crossover opportunity to incorporate on-site hide processing equipment in new regional slaughterhouses to increase traceability and value to ranchers.
- **Cotton:** Highly commoditized industry with \$7.9 billion in exports in 2019;<sup>11</sup> ample supplies should be available for U.S. reshoring projects that return a higher share of value to farmers.
- **Hemp:** Emerging industry with major potential for rebuilding equitable U.S. processing systems; significant gaps in U.S. processing infrastructure.
- **Flax:** The work of Fibrevolution offers a “whole-plant” approach to profitability; investment is needed in processing equipment.
- **Fibers from “Waste”:** Innovative models using crop by-products, textile scrap, and invasive species offer investment-ready options.
- **Natural Dyes/Dyeing:** U.S. natural dyes are in increasing demand by brands; garment-dyeing capacity is a major bottleneck.
- **Cut & Sew Stage:** The supply chain is not complete without addressing issues of worker recruitment and justice at this critical stage.

### The Key Role of Brands:

Beginning in the early 1900s, apparel and home textile brands built a multi-tiered, highly fragmented global supply chain designed to chase the lowest prices. Overseas production has led to an industry practice of extremely long lead times, up to 18-24 months, and a system of outsourcing and subcontracting that can make environmental and labor violations invisible even to highly ethical brands. **These industry conventions create many disincentives and barriers for brands to work directly with farmers and mid-scale U.S. fiber processors.** Reforming this model and moving to greater transparency and traceability will require creative use of philanthropic capital.

[Access More: Understanding the Supply Chain](#)



Leather production, photo by Ethan Harrison, courtesy of Pergamena Parchments & Leathers, Montgomery, New York

# FINANCING AND BUSINESS MODELS: CURRENT LANDSCAPE AND OPPORTUNITIES

With the backdrop of the textile industry's roots in extractive capitalism in mind, it is vital to reexamine approaches to funding and financing in order to avoid replicating these dynamics in a new context. For this Roadmap, we have drawn on the concept of "integrated capital," a framework developed by RSF Social Finance. As RSF defines it, "integrated capital is the coordinated use of different forms of financial capital and non-financial resources to support an enterprise that's working to solve complex social and environmental problems."<sup>12</sup> The integrated capital approach mobilizes philanthropic capital, guarantees, flexible debt and equity models, and creative entity structures in a values-based approach to supporting a full economic ecosystem.

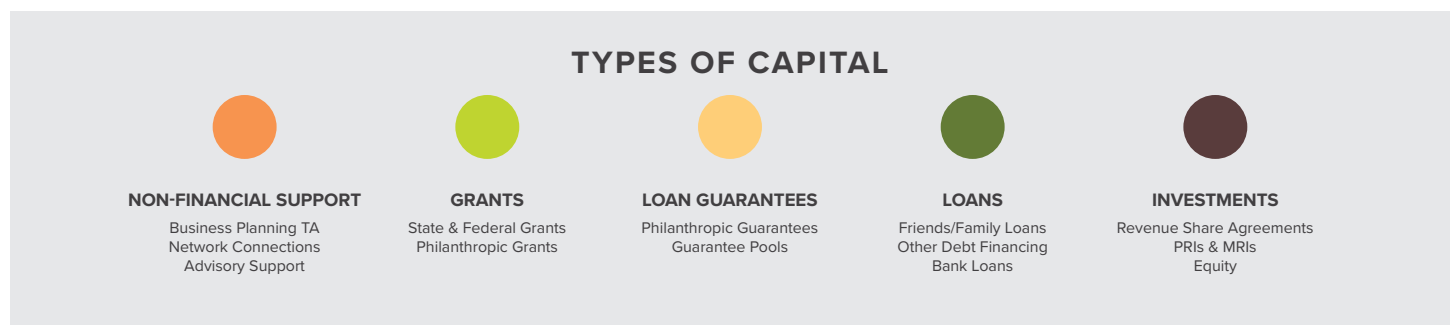
Putting the integrated capital framework into practice requires surfacing and re-examining unstated assumptions of the current neoliberal economic model, such as the concepts of "risk" and "concessionary returns." In a recent presentation, lender Andrea Longton of Opportunity Finance Network noted that "a lot of the measures that our economy uses to assess risk are built on biases, and especially on racist biases."<sup>13</sup> Similarly, investment expert Malini Ram Moraghan of Torana Group stated that "a lot of the impact investment space is incorrectly focused on this term of 'concessionary'—you're not 'conceding' lower return, you're paying for impact. And there's a very important distinction."<sup>14</sup>

Put differently, current "market-rate" returns actually reflect extractive practices and many externalized social and environmental costs. As one investor interviewed for this project asked, **"If the market is flawed, why do we demand a market-rate return?"**

Fully assessing risk and returns involves looking ahead to investment **exit strategies to ensure that wealth is created in, not extracted from, local communities.** Investors, farmers, entrepreneurs, and others shared **creative approaches to business models and entity structures**, such as co-ops and for-profit/non-profit hybrids, to unlock the full potential of integrated capital. These models are key pieces of the Roadmap.

Our interviews also showed that early funding for U.S. sustainable fiber and textiles has already been provided by a wide range of funders—including foundations, family offices, Donor Advised Funds (DAFs), Community Development Finance Institutions (CDFIs), federal and state government agencies, thesis-led investment groups, venture capital (VC) firms, and apparel brands—for a wide range of reasons, including 10 specific "Points of Intersection."

[Access More: Re-examining Financing and Business Models](#)



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# GAPS AND LEVERS

Findings from over 60 interviews have been synthesized and distilled into a **seven-year financial Roadmap** identifying **five key Gaps and Levers** where integrated philanthropic and investment capital would have the greatest impact in rebuilding the “missing middle” of the U.S. fiber supply chain.

## GAP 1: The Commitment Catch-22

The current industry business model led to the largest barrier we heard about—what we are calling the “Commitment Catch-22.” Fiber system entrepreneurs are looking to brands for contracts that will give them guaranteed revenue to increase production, but brands are looking for a guaranteed scale of production before they will commit to contracts. This prevents businesses from using such contracts as loan collateral. A similar conundrum exists for prototyping: entrepreneurs seek funds for prototyping, but brands want to see fibers already at the yarn or fabric stage before committing. The industry’s legacy of racial injustice compounds this Catch-22; as Fred Briones of the Native American Fibers Program noted, “There’s always barriers for tribes, who won’t qualify for traditional loans.” Jason Lindsay of Southeastern African-American Farmers’ Organic Network (SAAFON) added, “We haven’t been able to get the lines of credit that other farmers have been able to get. They [banks] are saying, ‘we have an open-door policy’—and ***we can walk through that door as much as we want to... we’re just not leaving with the funds.***”

## LEVER 1: Deploying catalytic capital to break the Commitment Catch-22

To break the Commitment Catch-22, interviewees from all categories shared creative ideas that helped us lay out an integrated capital Roadmap.

- **Phase 1 (Yr 1):** Establish a \$250,000 **revolving loan fund** for entrepreneurs to carry out prototyping with U.S. grown fiber crops.
- **Phase 2 (Yr 2-3):** Establish a \$2 million **guarantee pool**, funded by a combination of philanthropic funds and multiple brand commitments, to allow fiber entrepreneurs to obtain loans. As one investor put it, “You don’t even have to deploy capital; you just have to be ready to deploy capital.”
- **Phase 3 (Yr 4-7):** Establish a \$5 million **integrated capital fund** to deploy a full range of financing types for U.S. fiber production and processing businesses. Develop a “Divest-Invest” approach for market-rate investors to shift capital.

The funds above could be housed at an existing CDFI or family office to streamline overhead. **To redress the legacy of distrust caused by extractive financing practices, the decision makers for this phased fund must include Black, Indigenous, and people of color leaders; farmers; and garment workers.**

## **GAP 2: Financial Technical Assistance (TA) for entrepreneurs**

A prominent need that emerged was the lack of financial technical assistance and business planning support for fiber system entrepreneurs before they receive their first investments. While skilled in production, they lack appropriate TA to help them access capital for growth. A fifth-generation family business noted, **“We know how to make leather; we don’t know how to grow a business around this service that people may not even know they’re looking for just yet.”** An experienced investor added, “I have learned that in any early stage financing, the TA is actually more important than the money. Because if you can wrap an entrepreneur in knowledgeable TA, the capital will come in more easily.”

### **LEVER 2: Support Regional Navigators; fund fiber system business planning and TA; explore incubator/accelerator options**

- **Phase 1 (Yr 1):** Support existing and emerging regional “Navigators” in the West, Northeast, and Southeast with grants of \$100K each per year (\$300K total). These include Fibershed’s Regional Fiber Manufacturing Initiative (RFMI), Southeastern New England Fibershed affiliate leader Amy DuFault, and the Carolina Textile District. Develop a “community of practice” including university research, agricultural lawyers, small business agencies, and more.
- **Phase 2 (Yr 2–3):** Recruit textile executives in a mentorship group to offer fiber system business TA for a range of entity structures. Connect with MBA programs and business students to provide TA; “pressure test” with textile industry experts. Begin discussions with existing incubator/accelerator programs to explore options; develop a specific budget and revenue model.
- **Phase 3 (Yr 4–7):** Launch and run accelerator cohorts for U.S. fiber system entrepreneurs; ongoing support for regional “Navigators.”

**To further address past discriminatory financing, ensure that Black, Indigenous, and people of color business TA providers receive specific support.**

## **GAP 3: A voice for the growing movement in U.S. trade and agricultural policy**

U.S. agricultural policy is a major factor for the fiber and textile industry. One brand representative candidly stated, “We don’t see very much promise in the revitalization of the garment industry in the U.S. going all the way back to agriculture—the first thing that comes to mind is the **lack of supportive policy**, and the favoritism toward big ag, corn, soy, etc.” In other policy areas, advocacy is needed regarding clearer regulations for industrial fiber hemp production and the Garment Worker Center’s SB 1399 bill to eliminate piece-work pay. Finally, ongoing impacts from NATFA and CAFTA and emerging impacts from the new United States-Mexico-Canada Agreement (USMCA), the trade war with China, Country of Origin Labeling, and policies on single use plastics were all mentioned as key factors by interviewees. The movement lacks a unified voice to engage on these policy issues.

### **LEVER 3: Support connections with existing trade associations and policy nonprofits; explore separate advocacy capacity**

Crop infrastructure profiles in the Roadmap highlight existing trade associations, which include the National Council of Textile Organizations (NCTO), cotton industry trade groups, and the American Sheep Industry Association. However, there is no single trade organization focused on the needs of mid-scale U.S. natural fiber producers and processors who seek to produce for a reshored U.S. industry. Initial philanthropic c3 and c4 funding of \$100–200K per year is needed to forge connections with existing trade associations and policy-focused nonprofits, explore needs for separate advocacy capacity, and develop a specific fibers-focused platform for the 2023 Farm Bill.

#### **GAP 4: Data and research needs**

Interviewees from all groups highlighted key data and research needs. Industry experts noted that the last time the U.S. government did a full report on the U.S. textile industry was in 1987.<sup>15</sup> The USDA Census of Agriculture currently includes almost no data for fiber crops other than cotton, and interviewees also highlighted needs for research on the agricultural and processing components of U.S. fibers and leather. While research needs on regenerative agricultural practices and impacts are discussed in detail in other recent reports,<sup>16</sup> carbon sequestration data is especially needed for regenerative fiber crops. Finally, both entrepreneurs and investors called for more consistent financial assessment tools, including “True Cost Accounting” systems to assess brands’ externalized costs in overseas production and “common sizing” tools to give investors a clearer understanding of textile industry benchmarks.

#### **LEVER 4: Public-private funding for updated U.S. government textile industry data; True Cost Accounting & common sizing tools**

The scale of research needs calls for government involvement, and public-private funding approaches could catalyze government re-engagement with the needed data collection. Working with NCTO and other partners, philanthropic funding of \$100K could spur discussions with the U.S. Department of Commerce and capitalize on federal government interest in critical U.S. supply chains,<sup>17</sup> with the goal of having an updated version of the 1987 federal textile industry report released for its 40<sup>th</sup> anniversary (1987–2027). Funders and investors should also work with existing NGOs to assess, tailor, and promote True Cost Accounting & common sizing tools for the fiber sector.



## GAP 5: Investment in localized supply chain infrastructure

A major finding from our interviews is that U.S. fiber processing infrastructure is fragmented, fragile, and in need of modernization. As one industry expert put it, at many stages, **“you’re dealing with the last players standing.”** While a few regions, notably the Southeast, retain a critical mass of infrastructure, supply chains often crisscross the country. Interviewees flagged a need to recalibrate investors’ expectations for agricultural and manufacturing enterprises and avoid what one CEO called “applying the tech valuation criteria” to the fiber and textile industry.

While infrastructure investments are critical, **they must be integrated with funding for the field-building, TA, data, and policy work above to fully succeed.**

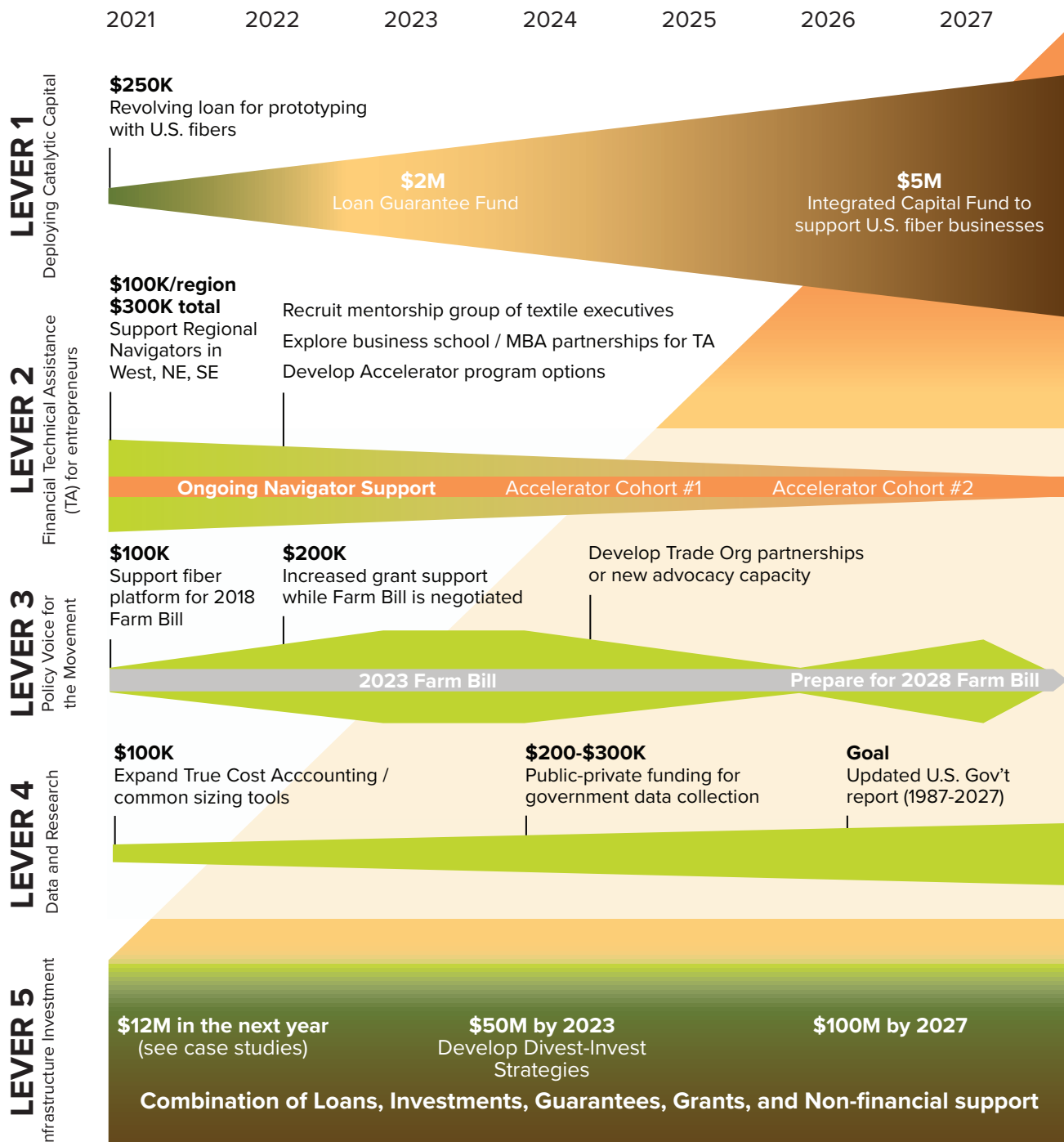
## LEVER 5: Investment over time in individual regional infrastructure projects

- The 12 Case Studies included at the end of this report represent just a small slice of the innovative, place-based fiber system businesses that exist or are emerging across the country. Each one offers opportunities for funders and investors to deploy integrated capital approaches. Case Study businesses profiled in this report are seeking a total of **\$12 million by 2021 and more than \$50 million in specific support over the next three years, including opportunities for grants, loans, guarantees, Program Related Investments, traditional investments, VC funds, and more.**
- Fibershed’s RFMI has identified other individual investment needs in the West, as well as opportunities to close gaps in processing for wool, bast fibers such as hemp and flax, and vegetable tanning for leather.
- In leather, Other Half Processing identified a key need to incorporate on-site hide processing equipment in new regional slaughterhouses as they are being permitted and built, in order to preserve hide traceability and quality for U.S. leather production.
- Other key opportunities include grants for hemp testing by Tribal colleges and VC-type investments in traceability technologies for cotton.
- Support is needed for co-ops and other entity structures that increase farmer leverage and allow wealth-building financing approaches.

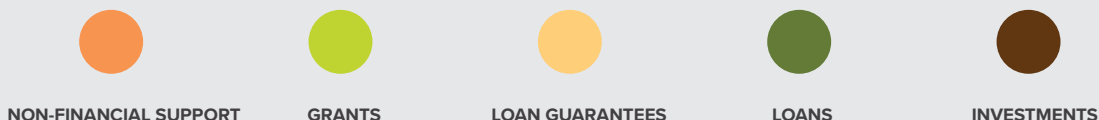
**Taken together, these five Levers offer a vision for a coordinated national Roadmap that leverages multiple forms of capital to accelerate the development of a more just and resilient U.S. fiber, textile, and leather system.** The Roadmap team seeks to continue dialog with many partners—including the members of Sustainable Agriculture and Food Systems Funders (SAFSF), the Fibershed RFMI and other regional Navigators, and investors and funders of all types—to build the funding and vehicles needed to put the Roadmap into action.

[Access More: Taking Action on the Gaps and Levers](#)

# THE VISUAL ROADMAP



## TYPES OF CAPITAL

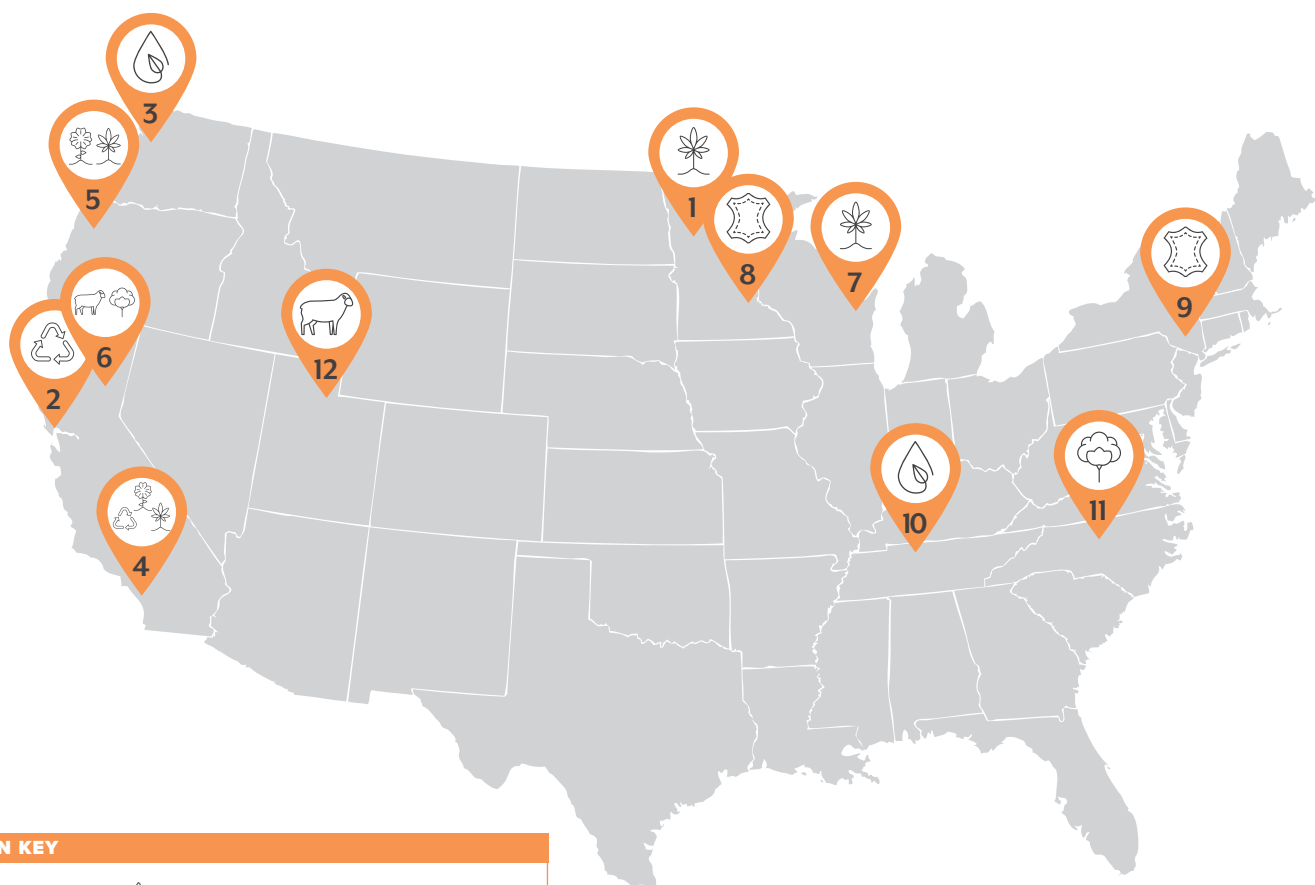


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# CASE STUDY MAP

The 12 Case Studies included here represent just a small slice of the innovative, place-based fiber system businesses that exist or are emerging across the country. Each one offers opportunities for funders and investors to deploy integrated capital approaches.

- |   |  |
|---|--|
| 1. Anishinaabe Agriculture Institute/Winona's Hemp, LLC | 7. Native American Fiber Program         |
| 2. Apparent Ventures LLC                                | 8. Other Half Processing SBC             |
| 3. Botanical Colors                                     | 9. Pergamena Parchments & Leathers, Inc. |
| 4. Circular Systems SPC                                 | 10. Stony Creek Colors                   |
| 5. Fibrevolution LLC                                    | 11. TS Designs / Solid State Clothing    |
| 6. Huston Textile Company                               | 12. Wild Valley Farms                    |



## ICON KEY



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**Farmers and Ranchers (others included in Processing Businesses below):** Bert James, Homegrown Agriculture LLC, NC; Jason Lindsay, Southeastern African American Farmers' Organic Network (SAAFON), NC; Spencer and Abbey Smith, Smith Ranch / Savory Institute / Jefferson Center for Holistic Management, CA; Jacqueline Smith, Central Grazing Company, KS; Julius Tillery, Black Cotton, NC; Albert Wilde, Wild Valley Farms, UT; Zeb Winslow, Z3 Agriculture, NC.

**Processing Businesses:** Anishinaabe Agriculture Institute / Winona's Hemp, MN; Sarah Bellos, Stony Creek Colors, TN; Fred Briones, Native American Fiber Program, CA; Lara Burton and Marta Kephart, Apparent Ventures, CA; Claire Crunk, Southeast Hemp Fiber / Trace Femcare, TN; Kathy Hattori, Botanical Colors, WA; Taylor Heisley-Cook, The Hurd Co., CA; Molly Hemstreet, Industrial Commons / Carolina Textile District, NC; Eric Henry, TS Designs / Cotton of the Carolinas, NC; Ryan and Kat Huston, Huston Textile Company, CA; Jim and Mark Kleinschmidt, Other Half Processing, MN; Jennifer Knight, American Woolen Company, CT; Stephen and Jesse Meyer, Pergamena Leather, NY; Dawn Oliveira, Oliveira Textiles, RI; Isaac Nicholson and Ricardo Garay, Circular Systems, CA; Josh Nusenbaum, SeFF Fibers / Quality Hemp Initiative, UK / NC; Chris Riley, Golden Touch Alpaca Farms / New England Alpaca Fiber Pool, MA; Dan St. Louis, Manufacturing Solutions Center, NC; Angela Wartes-Kahl and Shannon Welsh, Fibrevolution, WA / OR.

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## CASE STUDIES

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