



Sustainable Fiber Systems: from Field to Factory

Speakers:

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Rebecca Burgess

- Collective consciousness around what we're putting in our bodies is not the same as what we're putting on our bodies
- 2011—made a commitment to wear a wardrobe whose dyes, fibers, materials had been sourced within 100 miles
- Marcia and Rebecca are both funded by the Rathmann Family Foundation
 - o One aspect is focusing on soil, the other is on biomass from rangeland
- We need to understand the climate consequences of scaling regional fiber systems
 - o You can measure and map carbon from your soil to your skin—need to look at these details before scaling production
- Your clothes are from the land; current system creates environmental and social degradation—fiber production can reverse this degradation
 - o Jacobs sheep (ppt) is color-grown: don't need dye
 - o Opportunities for prototyping a new way of doing things. Can't say they've scaled this yet, but there are people trying to do this
 - o Northern CA—working on an artisanal level
- \$35 billion a year cotton market; 8k liters of water per hectare used
 - o 3 of the top 10 most toxic chemicals to human health are used on cotton throughout the world and the US
 - o In the US, 6 states have found a chemical in groundwater that causes death on human contact
 - o China #1 producer of cotton; can use these chemicals in mass due to different regulations (6-10 passes per production)
 - o Cotton creating cancer in Uzbekistan; produced with child labor; also uses rangeland
- 10 years ago genetic modification wasn't prevalent
 - o Today GM cotton is cultivated on more than 80% of cotton fields; ten years ago only on 12%
 - o Monsanto blaming cotton farmers who are supposed to be planting hedge rows of non-BT cotton to deal with insects; boll weevil and pests being driven to GM cotton and leading to pest resistance because farmers don't have money to do so

- Cashmere goat overgrazing has led to massive desertification & CO2 emissions—trying to get a cheap high quality material into the mainstream
 - o Scaling needs to be done carefully!!
- State of the fiber processing industry—do *you* have access to farmers’ market fibers? Probably not.
 - o Synthetics are what most people have access to—they create stretch in jeans and performance wear gear, but also create a paradox! You’re using synthetic fabrics in environments that it’s destroying—contributing to climate change, water pollution
- Fossil fuel-based synthetic dyes—lots of them—pollute, as do finishing materials. Currently textile production is the 2nd largest polluter of water (agriculture is #1).
 - o Synthetic fossil fuel-based fibers introduced post-WW2 are major sources of ocean pollution
 - o Wash water (waste) carries fiber lint
 - o Most prevalent share of plastic pollution on beaches comes from wash water—still dealing with the fact that microfibers are ending up in the environment and bioaccumulating
 - o Every color in this room came from a fossil fuel base—as we divest from fossil fuels we won’t be able to use them for color. We’ll need to preserve fossil fuels for future use and dyes won’t be high on the list of priorities
- We used to buy clothing that was manufactured in Providence
 - o Textile mills of the southeast—out of 1500 cotton mills near North Carolina, there’s one left.
 - o Rural south sees NAFTA as having a terrible impact on their livelihoods—it was the hallmark of industry in small towns. Some say that within a few weeks, industry moved overseas
 - o The US industry has been exported.
 - Triangle shirtwaist factory fire in 1911 in NY; 2013 garment factory collapse in Bangladesh—1000 people perished
 - o We went overseas for the cheap—not for quality
- We are in a state of overproduction
 - o What to do with textile waste? More than 68 pounds of clothing/textile are discarded by every American each year
 - o Can only recycle polyester 3-4 times; polyester and nylon and acrylics can only be landfilled
 - o Only cotton can be recycled—if not mixed with a synthetic fiber
- Fibershed—a working model to regionalize and decentralize farming and processing for an equitable and ecological fiber system
 - o Aging wool producers; breeding has changed and animals are being bred for meat and not fiber—fiber has changed and is becoming rough
 - o 1.4 million pounds of waste wool in CA
 - o Fibershed matched an aging wool producer with a young designer under the age of 30 in the first year—designer comes to the farm and meets the producer, and a professional photographer and videographer come along—encourages community building; after garment is finished, artisan goes back and bring the garment back to the farm
 - o At the end of one year, relationships between 120 farmers and artisans

- For-profit co-op to build relationships; online market to control means of production; send from studio/farm direct to consumer
- \$40k has cycled through this group in 1 year
- One farmer has launched a yarn business—sends to NY and Japan
- Hands-on training to schoolchildren from sheep to sweater—15 schools, shear sheep to knit a sweater
- Establish a baseline for economic development—green livelihoods program
 - What to do with all of CA's wool? Mapped all of CA wool from Jan-May 2013. Couldn't map every sheep, so what's a relevant # to extrapolate out? Mapped more than 30% for feasibility study—saw every bale of wool and met every farmer
 - CA produces 4 million pounds of wool annually; 1.4 million pounds are underutilized
 - New Zealand and Australia wool is based off of micron count—majority of our fiber (close to a million pounds) is competitive with that in the rest of the world and no one knew! Everyone said that fineness is being bred out of wool. In the Bay Area—everyone had anecdotes of high micron count because the micron count is high. But that's not the case down south!
 - We have a potential product that no one's mapped
 - Make felt/rugs/ carpets from 25-30+ microns—but less than that it can be next to your body
 - Close to 85% of fiber is white—which means that it's strong and there are natural dye-based systems developing in CA
- The other CA fiber developing is cotton—no one in CA actually wears the fiber that's developing because it can't be processed in-state
 - People increasingly want to develop a cotton you don't have to dye
 - Looking to blend cotton and wool to make a vidella—endemic CA fabric that utilizes developing CA cotton—washable and wearable
- Outcomes of this case study:
 - Diversity of jobs
 - A third of income can come out of knitting at home
 - Women can take one class and dye—income
 - People were starting to move money and jobs
 - Developing a community of conscious urban and rural residents—and this leads to communication and education around more conscious choices
 - Wool breathes if knit correctly—you can wear it year round
- Fibershed is trying to map a soil-to-skin lifestyle practice—creating a replicable module and an analysis. Mapping carbon in a whole new way—comprehensive and could become an industry standard

Marcia Delonge

- Research based on rangeland used by grazed cattle—because that's where the data is
- How to address, adapt, and mitigate climate change with regards to garments?
- Where are opportunities for climate change mitigation? Need to take a step back—producing fiber, dyes, transport & production, issues of care & garment lifestyle, disposal
 - Greenhouse gas emissions come from every phase of garment production just like production of anything—CO₂, methane, NO

- Climate change also stresses our water resources—how to reduce stress in water systems?
 - Water is already a limited resource—we’re already exporting water through virtual water trade (we’re exporting water through agricultural products and the materials we use in one place being moved to another region)
- Keeling curve—atmospheric concentrations of CO₂ in the atmosphere
 - Plants take in CO₂ in the summer, and in the winter atmospheric CO₂ increases—think about plants and land management as an integral part of climate change
- Lots of opportunities to reduce emission—including opportunities for carbon sequestration
 - Looking towards evaluating the differences between fibers, ways to mitigate climate change at all steps
- Why focus on rangelands?
 - They’re extensive—almost 40%+ of land cover in CA—that’s huge
 - Rangelands connected to wool production
 - Globally they cover 3.3 billion hectares—make small changes to land management and scale them up to have HUGE impacts
 - They’re valuable—and undervalued. Ecosystem services are often overlooked (e.g. carbon storage. Grasses allocate carbon to roots; put it into soil and don’t invest as much into above-ground structures because they die)
 - Lots of rangelands are privately owned—in CA 63% are privately owned
 - Owners need to have mechanisms to keep those rangelands as rangelands
- Can we manage lands to bring more carbon into rangelands?
 - Does different rangeland management result in different amounts of carbon soils?
 - Yes—there’s very large differences—and management seems to drive those differences
- Marin carbon project—can soil carbon be moved in a positive direction in a short time frame?
 - Apply compost to different study plots in a valley and coastal site; composted sites provide more forage
 - Increases in forage production of 40-70% on composted sites for 5 years—after a one-time application!
 - Increases in carbon beyond the soil application also
- Life cycle of the compost: how does that play into the picture?
 - Compost diverts waste from landfills, which are huge methane emitters
 - Composted plots were able to reduce net emissions by 20 metric tons of CO₂ per hectare—can do really good things through management
- Mitigating climate change isn’t enough; need to adapt to it also
 - Air temperature and precipitation are changing
 - How to cope with changes in water supply? (data from Alan Flint)
 - 6.5% decrease in water demand in a case with increased water stress from soils with higher water retention

Bringing pieces/work together

- Farmers potentially getting money from wool will still be an issue

- Farmers & ranchers who are young (under 28) but getting management practices
 - o Fibershed can create a market demand by creating a mill—but there needs to be a third income stream
- Rancher uses sheep to graze in a vineyard—creating a diversified income stream—Robert Erwin
 - o Land paid for by a vintner
 - o Grain has grown up out of balance with the farmers' income
 - o Mob grazing in pulses; transport animals throughout CA; graze outside vineyards in unused rangeland
 - o System might also reduce GHG from wine production
 - o Can new ranchers and farmers be PAID to graze part of the year?
 - Protect rangeland in CA, mitigate climate change?
 - o Breeding sheep that are grass-fed and for fiber—unique
- The Rathmanns fund people and fund research—they give stipends and pay for research and support innovative work
- Have already developed 17 different affiliate Fibersheds internationally
 - o Open-source data—people are mapping their wool in Fibershed affiliate communities
 - o Scale=replication

Discussion

- Differences between carbon of grazing sheep and cattle?
 - o Suggest that 7 sheep or goats are equivalent to one cow—proxy livestock data for sheep? They graze differently and have different manure values. Carbon emissions are different than grazing/rangeland data
- Different models of fiber production—leased & recycled
 - o Reduce consumption through piecemeal production (replace high use areas)
 - o Superwash system needs to be improved—scouring process uses water and chemicals to clean wool
- Organic vs. conventional cotton
 - o Need to create demand
 - o 2011 cotton 'crisis'—prices went up to \$3 a pound (\$.80 today)
 - o Fiber producers are trying to decommodify cotton—change the relationships between the means of production and the farmer and relate it to a place
 - o Create consciousness and demand—farmer and consumer work together to decommodify the system
 - o Need to invest more into public research side
- 37% of rangeland in CA is public—and only in Marin County it's managed organically
 - o Need to manage publically held lands organically
 - o Working on policy---partnerships
 - o Marin carbon project active in policy already
 - o Need for science to reassure manufacturers
- Potential for Environmental Working Group to do interesting work around what's in our clothing—could be very similar to what's being done in cosmetics campaigns