

*Hi and welcome to this week's episode of Sustainable Textiles from Finland. This week we're going to talk about linen and a production of it in Finland.*

*My name is Ann-Sofi.*

*And my name is Wilma.*

*And today it's the 2nd of March 2023. And we are located in Karjaa and Vaasa. We often hear that the world as we know it today is no longer sustainable, that natural reserves are running out and we cannot continue like this.*

*However, the solution is not so much to deprive ourselves, but rather to envision life differently to change the paradigm. In 1987, the World Commission on Environment and Development published a report also known as the Brundtland Report, where sustainability was defined as sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*

*Several initiatives exist. Imagine the world differently and rethink our relationship with the world we live in. The question of priorities and seeking a more sustainable lifestyle. To do this, many sectors need to be rethought, and this is also the case for the textile industry to tackle.*

*The textile industry is one of the most polluting industries in the world. The consumption of clothes increases while their lifespan decreases. These costs that are sold at low cost have, however, very high environmental and social cost. According to research done by the European Parliament, 79 billion cubic meters of water were used by the textile and floating industry in 2015.*

*For example, a lot of water is used when growing and producing cotton, which is the most used natural material, including concerning synthetic materials to manufacture, requires the use of chemicals and when they are thrown away, they are very difficult to recycle. On the other hand, linen is a historically used material which have gradually disappeared in favour of more profitable materials present many advantages, such as less water use and ability to be recycled.*

*Most of linen production is located in Europe, which benefits from the necessary richness of the soil and the ideal climate. Linen has several advantages. It is a material that allows local production, which decreases negative environmental impacts from long transportation distances. Linen has also all the necessary qualities to develop and exist in Finland as it has previously been found here as well. Furthermore, according to CFD, the linen fiber is resistant, which allows it to last over time and as a natural fiber it is easily recycled. This project considers sustainability in different ways, such as allowing an alternative to the polluting textile industry as we know it, but also to reintroduce the plant in its natural environment, which benefits for the soil and other species are multiple. It also allows the transmission of know how and another way of cultivating the soil.*

*Today we get to hear from Leena Pesu who comes to tell us about the project Linen stories. Their goal is to reintroduce the culture of linen production back into Finland. Linen Stories invests in building industry knowhow and a production chain chains necessary. They do cultivation experiments together with organic farms and look for the varieties and cultivation methods best suited to finish conditions. Leena will also tell us about th Fibershed, which focuses on regional and regenerative fiber systems. We can hear more about Lena's stories and a future of DNA production in Finland from herself. Enjoy.*

*So today we are talking to Leena Pesu who is involved in reviving natural fibers in Finland. She is the CEO of Linen Stories and advocates for the production of local natural fibers through fiber at Finland*

*and other collaborations. Now we'd like to thank you for great to talk to us and welcome to the podcasts.*

Sure. Thanks. Thanks for the invite.

*So we'd like to begin by hearing about your background and how did you get involved in Linen stories?*

Yeah, sure. My background is in whole other businesses to begin with. So there's maybe a kind of a part of some sort of a midlife crisis to start thinking that what is the really the impact of what I'm doing with my life and with all this environmental crises and climate change and everything. In my previous job, I was feeling that what I'm doing is, is really too abstract and too distant from all the burning problems that are in the world. And I started to search for what could that possibly do that were going to be closer to my heart and where I could use all the experiences and skills that I had learned. I was a consultant for a long time before jumping into this.

When I went through the soul search of what is close to my heart I found sustainable fashion. I started to study the subject and all the different, for instance, environmental impact of different materials. And then I ran into linen as one of the most ecological materials. What struck me was that both linen and wool are on the top of the list on what is the most environmentally friendly materials, the way you can produce textiles. And both of those could be produced in Finland. But then I started to search into why they're not produced? And they found that okay, wool is getting some kind of a revival at the moment, but for some reason, linen, which used to be so abundant in here and we all have grannies who have grown that that made it's out, they own towels in the saffron from linen, then it just doesn't exist.

I just thought, I'll get into it and talk to my brother who's a farmer. And he said: Well, why don't you give it a try? I've got like to try what if what it's like to grow linen? And then they said, well, come, grow it on our field or on a corner there, and then it all got started. Then I just fell in love with the material and decided to jump into business and really bring it back to Finland and that is the mission in Linen Stories. So that's a long story short.

*Okay. So it's mentioned on Linen Stories website that the linen has a long tradition in Finland, but there's been no production here for decades that you know about this story. Could you tell us briefly about the history of linen production in Finland and how was it produced and why did the production stop?*

It's a couple of hundred years ago. It was it was grown every in every single farm because people used to grow their own fabrics and they are grown fibers, but then they gradually, when cheaper fabrics like cotton started to come to the market, it was much easier to go and just buy that cheap cotton and people didn't want to grow it any longer.

There was a bit of a revival after the Second World War when it was difficult to get fabrics again, and then people kind of tried to start it again, but again, that war and that situation got easier. So again, you just forget about that again and revert to cotton and then synthetic and synthetic material, so it started then we stopped several times.

There was also an era of industrial production more than what was in the past, kind of until 200 years ago, but in about 20 or 30 years ago, there was an interest towards growing our linen into more of technical applications and partly also for textiles.

And there's a bit of that kind of that experience and the machines as well left from that era, but at that time they couldn't make it economically viable. So and also so there was even the spinning mill in Finland in 2008 that went into bankruptcy, 2008.

So it is not that reason actually that that's how we had a kind of a production of linen. Was it small scale? It was a relatively small if you compare to how much how much linen is produced globally. But yeah, but even on an industrial scale, okay, like if you talk a little bit about linen, it's often said that it's a sustainable fiber.

*But what are the benefits like? What makes it sustainable and what are the benefits compared to other fibers?*

Well, it all starts from the plant itself. So the plant is called flax. And when it's processed in New York, then it turns into linen. And the flax as a plant is something that when it grows, it actually doesn't take a lot of nutrients. It also does not take a lot of water. So you don't need a lot of kind of irrigation, like cotton, for instance, which takes a lot of water.

And then actually when it's growing, the root system is such to improve the soil structure. So when you grow flax on a field, on a given year, on the next year, you need to grow something, something different. In that there's a principle of rotation and once you have grown flax in there, the next crop is actually doing much better because the soil is in such good shape of the flax. So those are some of the good environmental aspects of the production. So it's really minimal inputs and really good for the good for the soil.

*Okay. Are there like other positive aspects of learning and are there some negative aspects related to either learning itself or in this production or some other positive aspect that there are?*

Also, again, if you compare to other materials, is very durable. If you have a have a fabric that is made out of linen compared to cotton, for instance, then it's much more durable. So you can make a cloth that will last much longer. So again, kind of reduces the amount of consumption and then the textile fibers actually only like 50% of the entire flax plant that's the rest of the plant can also be used for different uses. And a lot of thought use is actually something where flax or the site streams out of that.

The production could actually replace some fossil material, so like PEAT, for instance, let's take an animal bedding, for instance, which in Finland, oftentimes when you need to put something in the stables for the for the horses and then for the air, for the cows, for instance, and what they use at the moment a lot is either peat or then wood, and you could actually, instead of those materials, you could use a part of the flax mix.

It's something that absorbs moisture a lot and absorbs the of the bad smell, and then you can take it together with the materials that the animals produce you can take it back to the field and it will compost in there.

So this whole kind of a system of the main products and then the same streams that are all kind of really beneficial to the nature and assist the farming system.

Okay. You asked about the negative aspects. Well, I can't really think of many. Of course, this one, my thing that okay, if you use the field for growing flax, then you're not growing food on that field. So it's kind of take that area out of food production, but it's also not the perennial plant.

It's only there on one year at a time. I mean, it improves the crops for the next year, so in a way, that's kind of reduces the negative amount.

Then there are a second thing is that, of course, if you do produce it in a way that it was done earlier, if you take the flax plant and you rent it to separate the fiber out of the plant and you do it in the river like was done earlier, that would pollute the rivers, but that's not on maybe longer, so I can't think of any negative aspects.

*Yeah. Well we were looking a bit into research that there are certain potential negative impacts if chemicals are used or pesticides or fertilisers, so do you have knowledge about this?*

Yeah, that's correct. Yeah. Pesticides and herbicides are sometimes used. They're not used as much as they are on cotton, for instance, and I've been so focussed on organic them and then with those chemicals I used, I haven't come to think of that.

But yeah, you're right.

Yeah, but if we go to talk about your company then in the story, so according collect your websites, you're trying to get a production going again and then that. So can you tell us more about your mission and why did you want to produce in a production and in Finland?

Well, it was just as I said, that was just something that I noticed that, okay, this is really super good material, environmentally friendly, and I have to say I can't even explain it rationally. I just fell in love with the material, and I decided, okay, this needs to come back and we need to produce it again, and when I started with that, I started to learn more about the plant and more about the materials.

There's just more and more stuff that comes out and you just understand that, okay, this could be a really good opportunity also for farmers to get a new plant that they can get really good profits up and the soil improving aspects and the opportunities for replacing these fossil materials is just so much in there.

So it is more of a something of a mission that is pushing me forward somehow thinking that, okay, I want to build an ecosystem of companies around this and to make that kind of a lot of good things for many people and for many companies around that.

*Okay. So like, what stage are you right now? What have you done so far? And what kind of actions have you taken?*

I have been doing piloting so far, and so this is more of a learning the aspects of all the way from all the farming, all the way to processing and producing into yarns and then those different size streams.

And I'm at the stage at the moment, that's where I start to have a good guitar, kind of a picture on what is needed to scale it up. I'm just in the process of starting to get some get some funding or starting to look for funding that the discussion and having a proper business plan around all this.

So we have been together with some organic farmers. We have been doing a lot of a pilot farming now three years in a row and then producing fibers out of that.

*Has there been like certain successes or like what has been challenging like during this when you've been setting up linen stores?*

Well, there's been a lot of challenges, and I've taken those as learning opportunities. Some of the challenges are related to the weather and the climate and the problems. Usually what have been growing flax in Finland is that the autumns can be wet, and the autumns can be too cold.

But we've actually have it with quite the opposite way, kind of maybe it's the climate change, but it has been spent just to dry. So those risks for the farming have really materialized, then that will be needed to even destroy some of the crops because of that.

So that's been a bit of a challenge. But also at the same time, I've been very happy that we have been learning a lot and working with different farmers and working with a bit different techniques and different soils and looking at what is needed to make it work and what can go wrong. So now we have a lot more to build on going forward.

That's something been surprising, like something you didn't anticipate.

What would be are particularly surprising I think may be the amount of work that got. I mean you understand that that these different stages you read about the stages and the farming a stage in the processing. But when you actually go through all of those, you realize that there is a reason why this is a material that is more expensive than other materials and is something that people have moved away from because it takes a lot of time and a kind of concentration in each stage to make it really succeed.

But at the same time, when you do it, it really is really beautiful, and then the moment when you break the plant, then you start to separate the fiber comes out, this is a glossy, beautiful, long fiber. That's really amazing feeling.

*Okay. If we talk about like sustainability or like ecological aspects, so can you just describe like to the listeners, how is it being considered in your production?*

Well, first and foremost, of course, the choice of materials that we work on, flax is so environmentally friendly to begin with. We also make the choice to do it via organic farming, if possible, and this is what some of the challenges come. We might be doing both now in the early years, so but really to minimize the chemicals and, minimize all kind of a negative aspects to the soil. We would like to go organic.

Also, what we want to do is to build the factories close to the areas where the fiber is farmed or grown so that all the transportation gets minimized in a sense also to reduce the amount of transportation then also find the whole supply chain as much as possible and all the clients as well locally, so that we can be produced local production chains of local supply chains.

*You mentioned earlier about the industrial use of flax, and so is this something you've considered or like how are the flax being utilized?*

Yeah, so far, it's been mostly again just our piloting and those doing the small scale experimentation and looking at potential partners in that. These are some of the things that I will need some more funding to, to really scale up in the next stage. But yes, that's a lot of opportunities that are existing already in the main growing areas in Europe where you have a 100,000 hectares of flax being grown, then you also have this whole ecosystem running already.

It's a lot of those things can be kind of copied directly. But then I also think that there's a lot of skills and knowledge in Finland on how cellulose based that you love can be used, that there's also a role for new innovations, When we talk about with new partners a little bit building on that because you say on your website that the industry is building industry knowhow and production chain, so how have you been doing this? What pushed put that?

Firstly, what I've been doing is that I got myself a small processing line to start really doing it on my own, so this is a small line that actually worked. We just put the black straw in there and it comes out sort of the fiber is separated and this is some kind of first transformation stage.

And I thought this is this was something that I was hoping that could be scaled up for bigger production, but I noticed that, okay, capacity is not big enough for really ramping it up. So what I'm looking for is not maybe some partners to build a similar but bigger factory like that in in Finland and then looking for also for partners for the following stages.

So I'm not looking at doing everything by myself or even with people joining Linen stories, but rather building a group of companies that work well together, and it's using their own expertise on the particular materials, so particular market segment so that we can all kind of work well together.

*So, I mean, can you tell us what are the main markets for industries like that and who are your most potential customers?*

Well, the main products for us would be the textile fibers, and for those are then the main customers would be them either spinning mills or then if I work together with the spinning mills and then sell the yarn, then it would be companies that make fabrics or then brands that make fabrics themselves.

And I'm hoping that they would be either in Finland or in the nearby regions so that closeness of the material production, this is kind of a benefit that's our advantage. But then in terms of the other sites dream and there's potential clients in construction, in agriculture in animal husbandry, in gardening, and then even this innovative biomaterials. So that's a lot of this is where I'm not certain yet which one will pick up the best and which one will become the most biggest clients. But, but that's, it's a wide range of potential areas.

*Yeah. Is sustainable organising like an important theme for these potential.*

But at least other companies and brands that I have been talking to, it really is under the way that they see that one aspect this locality that for instance I spoke with a carpenter that works on refurbishing old wooden houses and our linen is traditionally used as insulation material between the logs and he was really excited to phone me about another carpenter and say that it's really amazing that he has a project with architect has specified that they need to have materials that are that way, you know, the origin of the material and it should be organic if possible.

So they were like super excited that now they could actually get finished in that manner, which is organically produced. So that's just one example. But the same things when I talk to people are really excited that okay, it is amazing that we could do this locally and organic and habitat you have any like environmentally friendly materials replacing the other like peat for instance.

*You're also engaged in the non-profit organization Fibershed Finland. Can you tell us more about the organization, like what this fibershed do and what are its aims in Finland?*

Yeah, so this is something the Fibershed overall is an organization that started in California, and I ran into it a couple of years ago and read the book by the founder of that movement, Rebecca Burgess. So what we do in Finland with the fibershed that we are an affiliate of the International Fiber Organization and share in that sense the same mission of kind of creating this regional fiber networks that are not only producing materials and fibers and natural gas locally within the vicinity of where it's being used, but also in a way that that is protecting the soil and improving the soil and improving the climate, and kind of being enabling living within the planetary boundaries for the people that are living in that region.

So that's the same as what we are trying to do in here and what we're really in the beginning here and just kind of starting to get organized and now starting to get into what would really be the key aspects in Finland that we need to adapt to and what is really needed in here to fill the gaps that we have. Because it is an impressive website they say focus on regional and regenerative fiber systems like can you explain what is meant by a regional regenerate like how is defined and how do these systems improve the climates and soil?

Yeah, they're just the two words. So one is what first is regional, and this is also where because I started in California, the trip really, really started to look into that why do we produce fashions and why like in China on in distant regions and why couldn't we do something close to where we live? And she started to look into what could be possible to produce in California, where she was living, and then the whole idea grew that, okay, you should build these regional systems.

Let's see, that's what could be if you could build this to complete supply chains within like a 100 mile radius or 150 hundred or 60 kilometers and that has been often the focus point for a lot of those local networks as well we chose to work within the entire Finland because there's only 6 million of us, so it doesn't make sense to narrow it down to such small areas. But anyway, keeping a kind of a regional on then note that whatever you work on or whomever you work on, they are close by geographically.

But then the regenerative refers more to how those fibers are being produced and regenerative agriculture as a whole. So they are ways of growing plants and ways of raising animals that that are more beneficial to the soil than others, and that those are the kind of techniques that Fibershed then advocate for and tries to promote so that people, for instance, if they have lambs, that they would let them graze in different pastures every day so that the grass will regenerate and that will also regenerate the soil, and once the soil is in a good condition, it will absorb carbon dioxide and hence it will improve the climate as well.

*I've been discussing these issues quite a bit, but so if you talk about Fibershed and then concentrate on just these regional regenerative fiber communities in Finland. So, what kind of communities are you specifically working with and what do they do differently?*

We are working in kind of groups of different fibers. So we're looking at wool producers separately and trying to network them and show them how to unless they are really going to produce wool in this way, I thought maybe teach them to change their habits a little, I wouldn't be so much worried in Finland. I mean, we don't have this kind of industrial farming for sheep here. So, every sheep farmers is, is really kind of efficiently organised at the moment.

But we're just trying to learn about how exactly things are done now. Is there something that we can maybe improve and nudge people forward into doing things even more involved in a more environmentally friendly way.

But then the other fibers like linen or flax or hemp, all these are all something where the production doesn't really even exist yet. They are people who produce hemp, and for more technical purposes and in Fibershe it is really an important textile fibers, so with regards to these best fibers then it's more like trying to grow the network and trying to create knowledge and inspire people and inspire producers to start producing those.

In that sense, all of those plants are such that they similarly to improve the soil and that they are being grown. So that makes them regenerative and pushing farmers then towards the regenerative agricultural practices altogether.

*Would you say that there are some kind of like societal changes created through like Linen stories and fibershed work to able to make like a bigger change?*

Well, I think that would come from also from creating the knowledge and communicating about it not only to producer but also to consumers, that people would understand that, Okay, why are examples of why a project that okay now we instance if we would do something that a fibershed in other countries have done what we could do is for instance have a community project where a village could come together and grow a patch of flax, for instance, and then they would learn to appreciate the soil and learn to appreciate the fact that it takes work and effort to produce the textiles that you're wearing and maybe making you more kind of knowledgeable and appreciative of the fact that what you wear matters and it has impacts to the nature as well and to people who are working and living around you.

So those are the kind of a kind of a big cause that we would have that with the work that we do and the communication that we do on projects and things that we do that we could push that message and make people understand better.

These type of things that are not simple words and create the demand and sort of producers would have people that would want to buy their fibers as well as in that sense, make it the kind of a not the vicious circle, but kind of a good circle on the spirit in upwards.

*How well have you so far like what is the awareness that knowledge of this? Like, I only heard about this, you know, for the first time that this is like linen production like, well, there is an aim to produce linen in Finland that is it even an aim yet or you try to keystone a low profile.*

Yeah, maybe that kind of answers the question and I read that you haven't heard about this. I don't think many have. Well, it's it has been quite low key so far, because I wanted to personally with my company, I wanted to make sure that we can do it and can make it happen and then all this stuff marketed more widely.

But I mean, it has been communicated in social media and have some people who are into fiber and sustainable fashion. I think they may have noticed and a lot of thought about they know about that. So it's get gaining ground fiber to Finland is something that we've had it kind of in the starting tracks for like two years now.

First with the COVID, it was a bit difficult to get Kit going because you had a feeling that, okay, since we cannot meet, we can't get it really going, and then there's been a lot of other things that come on the way.

So I'm not surprised with the very few people who know about fibershed that is something we're hoping to change during this year that really focusing on communications and getting members to our group and having them also spread the message in their own communities.

So really starting to focus really on those bringing that message around them, telling what other affiliates are doing and why are these things important. So, hopefully a year from now that would be a lot different.

Yeah. So in your opinion, like what is needed to further develop regenerative fiber production in Finland? Or even like elsewhere.

You know, this is a really, really good question and maybe a complex question that I'm think about every day. I think what is needed is somehow a good collaboration between many different parties, both the producers or small businesses that produce the fibers and small businesses that process the



fibers and make yarns out of it, then make textiles out of those yarns, and then the consumers that are willing to purchase those products.

So that the small businesses and then also I think that we need the public organizations, government or the regional organizations that would support it and bring people together and provide some funding in the initial phases for the projects, for our pushing forward universities and schools that would teach the students about these aspects and teach the skills that are required.

So I think there's a lot of smaller things that would need to be happening at the same time so that we are not I mean, we alone, Linen stories. I cannot do this alone. I can't fix production on my own or we as fibers association. We can't do all of this all on our own. But we can maybe be somehow the driving force on networking and bringing people and the different organisations together to push it forward. But I think it really needs good collaboration from a lot of different parties.

*Just as a last question, according to some LexisNexis statistics, only 1% of textile linen fiber is being consumed worldwide. That how do you see the future of linen?*

I see a positive future. I've seen these figures that are also understood that they are increasing so there's more demand for clean and as more and more brands and consumers are looking for natural fibers and more sustainable ones.

What is a bit of a maybe hurdle there is that it takes land, and I just understood that discussions with some partners in France is that even there the cultivation areas are not growing even though there's growing demand that's still there, not farmers that want to increase their area. So, I think we will see more and more demand growing but supply not growing.

So, there's room for more areas like Canada and Scandinavia to grow it, and at the same time, with the climate change, we need more areas up north to grow the plants. So in that sense, I see this as a positive one. I see it as something that could be a positive thing for Finland, for Scandinavian Nordic countries overall.

*We'd like to thank you very much for talking to us, and we really wish you and Linen stories all the best and success.*

Thank you so much. It was a pleasure. And to our listeners, thank you for listening to our podcast.

*We hope you learn a great deal about reviving natural fiber production. Until next time.*