

 **SEASON 1 EPISODE 3: Forests in clothes, packaging and buildings?**

**EPISODE TRANSCRIPT**

A ChatGPT verse

*I'm a resource that's truly green,*

*Renewable, a wondrous scene.*

*I capture carbon, a silent giver,*

*While serving forests as a whole river.*

*From me, textiles and packaging emerge,*

*In tall wood buildings, I take the verge.*

*Guess, what am I, so versatile and good?*

*A material cherished—oh yes, I'm wood!*

This poem was generated using Chat GPT and recorded using Speechify.

*Intro*

**JOSE:** Welcome back to Branching out: the forest podcast, where we connect forests, science and people. Brought to you by the International Union of Forest Research Organizations, IUFRO. Let’s discover the role of forests and trees for people and nature, while we unravel complex forest topics and keep you up to date with forest research.

**JOSE:** In the two previous episodes We talked about the IUFRO World Congress 2024 in Stockholm and about strengthening forest resilience and adaptation. Today we will speak about responsible forest bioeconomy. Stick around to learn how forest bioeconomy contributes to sequestering carbon, mitigating climate change, creating jobs and developing rural areas. And today’s cohost is Ida Wallin, from SLU, welcome, Ida!

**IDA:** Hello! Thanks for having me, José! Glad to be here for this super interesting episode about bioeconomy. A while ago, I was part of a collaboration project PerForm where we studied the social dimensions of a forest-based bioeconomy in Europe and it is great to return to the topic in the format of a podcast. In the PerForm project I had the great pleasure to collaborate with our first guest for today, Professor Anne Toppinen, from the University of Helsinki. She is a Congress keynote speaker for the theme “Towards a responsible forest bioeconomy” and she is here to put us in context. So let’s start from the beginning, what is forest bioeconomy?

**ANNE:** They are naturally very many different types of definitions and they are sort of narrow. The one would be that it's about transforming a variety of forest ecosystem services into biomaterials and production of bioenergy. Myself? I rather like relying more into the concept of Circular Forest Bioeconomy, which is emphasizing transformation from a fossil fuel dependent economy towards more circular and bio-based economy. So it's about processes in which virgin and recycled bio-based forest resources are utilized more efficiently and hopefully also in a balanced way in these industrial processes to create value to society. And in order to claim to be responsible, of course, the demand for wood in production needs to be done within the ecological ecosystem boundaries.

**IDA:** Forest bioeconomy extends beyond traditional wood products. Could you give us some examples of innovative and maybe surprising uses of forest resources?

**ANNE:** There are many of those, of course. One example that comes to my mind coming from my own country Finland is called a wood cast. I don't know if you have heard about it. It's a medical cast made from wood chips and biodegradable plastics. Another one, I think, is this new beautiful architectural designs or flagship buildings made of wood or libraries or school facilities made of wood and I think you see this popping up in many countries these days. So I think this is really something beautiful that's changing. The third example that comes to mind I think not too many days ago I just saw a picture of paperboard bottle introduced for a famous Swedish vodka brand. So I mean it's happening in the most innovative places, one never knows if this takes off or they go mainstream, but and there are lots of lots of activities ongoing for sure.

**IDA:** And what is needed, as you mentioned, to ensure a responsible use of these forest resources also in the face of climate change?

**ANNE:** Well, climate change is maybe only one of those big drivers. We also recognize biodiversity loss and limitations in using the natural resources in the face of growing population. So from industrial perspective, this calls for developing new products, genuinely new products also to serve the needs of the people. But I would say that responsibility is also related to the meeting of the people's demands. This has also fundamentally changed. You don't see a thriving newspaper industry anymore or copy paper much used in offices or education facilities. So It's about meeting the needs that are really crucial for people and also it's about dividing the profits, the revenues of these value creation processes in hopefully more equal and just manner.

**ANNE:** Like in the previous episode in the series, you were discussing resilience of forest systems, I also see resilience of forest industrial system as a core element to produce responsibly goods and services and should happen in resilient communities, helping adapt to economic, political or geopolitical shocks – so as a means of diversification of livelihoods is very important also here.

**IDA:** Are we really moving into the right direction? Do you see forest-based industries (and societies) worldwide move towards a low-carbon circular bioeconomy?

**ANNE:** I like to think positively that yeah, there are signs that we are moving into the right direction, but the second question is: is the change rapid enough in the light of all these challenges for having resilient forests and resilient forest value change? I would say that there has been a lot of hype around new forest-based products, for example, to pharmaceutical industry to substitute chemicals or concrete or steel in urban constructs solutions. However, in reality, at the moment, the market shares of these new products are still pretty low. So the question is, I think this is a very important question: How to accelerate this change towards having more of these new products? In business research community, we talk with a concept called incumbent inertia, so the big multinational pulp and biomaterial companies, they are still getting the main revenue from these traditional quite price sensitive commodity products like pulp or paperboard. This may have an impact on how hard there is a push for genuinely striving for new products or focusing the business into recycling and reusing materials instead of putting focus on a short-term and single-use products. So I think as societies and as consumers we should do a little bit more effort.

**IDA:** Thanks, Anne, and back to José.

**JOSE:** It's important to note that the examples may vary within regions due to the diverse forest ecosystems, socio-economic conditions, and policy frameworks in different countries within Asia, Latin America, and Africa. Before we go into that, because this is really connected, when we talk about forest bioeconomy, we normally talk about another concept, which is non-timber forest products, and our guests today will use this term many times. These are things that are not necessary wood, it could be nuts, or some other byproducts that are collected from the forest. And these NTFP can de definitely impact the rural livelihoods.

*Examples from Africa with* ***NELLIE ODUOR***

**JOSE:** Correct, we are happy to welcome our next guest from the Kenyan Forest Research Institute, and host of the World Congress in 2029. Welcome Nellie Oduor, Director of the Forest Products Research Programme and expert in the field of biomass energy in the region and she will provide some interesting examples. Can you provide examples of forest bioeconomy in Kenya?

**NELLIE:** Thank you so much for this chance to have this short podcast talking about forest bioeconomy and forest products.

**NELLIE:** We look forward, yes, in indeed definitely as KEFRI is looking forward to hosting the IUFRO 2029, definitely this is a region to look at.

**NELLIE:** Some of the products that I can think of, because as a country we are heavily dependent on biomass energy not just for domestic use, but for heating and I've also seen that even for industrial use, the tea industry uses biomass energy, the fuel wood for treating their tea and also for processing vegetable oil for cooking. They are using now biomass energy and this is now contributing a lot of stress on the environment. So that's one of the things that we are using the forest products especially in the biomass energy sector and it's a huge percentage, over 70%, of our trees go into all these sectors that I mentioned. Yes, actually it goes almost to 90% if you go to the rural areas, people are still using firewood and charcoal for cooking and heating. it's really highly dependent. In the urban areas it could be now close to 80%. But we are trying to reduce that with other renewable energy set items that we can be able to process.

**JOSE:** And do you know more examples from the region? Have you seen any positive outcomes from these initiatives?

**NELLIE:** We look at products that we can add value and adding value is like the indigenous fruits, we're looking at medicinal plants. And this will cause now the farmers to maintain these trees on farm because we are targeting to increase our tree cover on the land. And so when we get farmers to plant and to also maintain the tree species that they have, the indigenous fruit trees, like the tamarins, the baobab: so what we do is that because these are fruits that are in seasoned seasonally. Ah so when the farmers sell them, we tell them okay, can you value add? Then that way you can not only just sell it as a raw product, but we are able to have now economy just at your place, instead of selling it as a raw product. So I have got examples like the baobab fruit, that is indigenous in Africa and in Kenya, in much of part of the eastern part of the country. These are huge trees and for a long time, some of the farmers were removing them from the land because they occupy a lot of space, but this specific fruit has one of the highest sources of vitamin c. In fact, it became so valuable, especially the powder because it has seed and it's encased in a powder.

**NELLIE:** This formed areas where we've got entrepreneurs where we introduced them to farmer groups that they could now be able to have that arrangement with the farmers, that they could be able to collect the fruit when it's in season, they would keep it in store, they would process it if it's drying it and then the entrepreneur, if they are not processing it onsite, they would take it where they can be able to process it and get the powder. And then the seed oil, the seed would be pressed and it's a highly valuable seed. The baobab oil is one of the expensive seed oils that we have that is used as a carrier for perfumery and also for cosmetics. So this has formed microindustries and we've encouraged farmers actually to maintain these trees on farm and not only have we been able to incubate even one of the entrepreneurs, this was over six years ago, at KEFRI now so many other entrepreneurs have come in and their creativity in trying to get the products and vary the products from the oil that is collected is enormous.

**NELLIE:** The tamarind as well. We've had entrepreneurs who've been able to collect this fruit, because we've had marketers and middlemen who are able to collect this fruit and be able to export it the way it is, but then now when we've encouraged now farmer groups and enterprises who we've been able to collect them with the Micro Small Enterprises Authority in Kenya where they've been able to be housed at county level buildings and they've been able to process this further to make jams, fruit jams and fruit juices, which are now being found in the supermarkets.

**JOSE:** And though strictly speaking bamboo is grass, with the 2022 National Policy, Kenya is committed to using it to contribute to the forest cover, watershed development and carbon sequestration. What can you tell us about that?

**NELLIE:** There is now this tech next stage that the government is pushing, so bamboo has a huge target as well as other fruit trees and as well as timber products and to maintain and try and get the target of 30% tree cover. So right now we have a number of handicraft and enterprises that are processing bamboo in the country and we have a project that's funded by the International Bamboo and Rattan Organization based in China, they're implementing this project in the region, in Ethiopia, Uganda and Kenya. So we're having now a regional kind of outlook in trying to raise this particular plant to address livelihood provision, to address climate change interventions in terms of mitigation as well as making it an industrial product.

*Examples from Latin America with* ***VERÓNICA LOEWE-MUÑOZ***

**IDA:** Yes, next on our list is Verónica Loewe-Muñoz from the Chilean Forestry Institute, who is part of IUFRO’s Task Force 'Unlocking the Bioeconomy and Non-Timber Forest Products'. Welcome, what are some notable examples of forest bioeconomy activities in Latin America?

**VERONICA:** We have several interesting non-timber forest products coming from Latin America. Brazil has a huge, interesting basket of different species that produce really interesting products. For example, açaí which is very well known.

**VERONICA:** It's a fruit of a tree and very tasty by the way, and it was initially and is still harvested from native areas. But most of it now comes from plantations so there has been a domestication of the species, from which over 1.6 million ton were exported last year, generating an income of over 800,000 USD.

**VERONICA:** Other one from the Amazon area also from Brazil, including Perú and Bolivia, is the Brazil nuts, that in 2021 over 45,000 tons were exported from shell nuts. It's also a very interesting product that generates income and creates jobs for local people, for rural, marginalized populations. It's very important nutritionally because has a very different chemical content including a high amount of selenium, which is very good for aging people, for the brain function.

**VERONICA:** In Chile, coming to my home country, we have an increasing exploitation of NTFPs that include shrubs, trees. For example, we have rose hip and the pompón moss which is sphagnum magellanicum. This is a small moss that grows very slowly in very humid areas.

**VERONICA:** When it comes dry, it can grow in volume like hundred times. So it's used for example, for pollution control, for oil recollection in sea or in waters, as mulch, as substrate for plant production, for gardens in the decorative mulches...

**VERONICA:** Then several from trees, quillaja saponaria that produces saponine that is used even for vaccines.

**VERONICA:** Then for example, peumus boldus that produces the boldine that is quite used in Germany for herbal teas that has very digestive positive effect. Fungi, several fungi, suillus luteus, morchellas, lactarius, and others.

**IDA:** And we have also read about the Chilean hazelnut, the Maqui berry, and your work with the stone pine production. So, what impact have these example in the communities?

**VERONICA:** That's one of the challenges. Normally the populations involved in the harvesting include a high percentage of women and families. And usually they have a low educational level, are poor marginalized people with few resources and no capital or very little capital, no formal organization, so they have no access to the information mainly but mostly on prices, and so are part of this very imbalanced productive chains in which the most of the income goes to the middleman or the final traders.

**VERONICA:** There are huge benefits economically, so you generate income, socially, you generate jobs and also recreation, very interesting land settings. And environmentally, there is this carbon sequestration, erosion control and other benefits. So you contribute to poverty reduction, that is one of the SDGs relevant, to the sustainable management, to the health of the planet at the end, because you are sequestering carbon, regulating the water cycles and so on. And then the equality, trying to balance the economic development including marginalized populations from poor areas, for example, and so you can contribute really to a more stable country development, because when you have a higher level for the population, you will have a more stable social, you will have less problems, riots, which are very common these days.

**VERONICA:** Thank you very much!

**IDA:** Back to you, José, and more interesting examples from Kenya.

*Examples from Asia with* ***JINLONG LIU***

We want to learn about a few examples, that’s why we have invited Professor Jinlong Liu, Director for the Centre for Forest, Environmental and Resources Policy Study of the Renming University of China. In the context of forest bioeconomy, I understand you have studied the historical development of the non-timber forest products in China, could you please give us a short summary from, say the Xia Dynasty until today? What are some specific examples of products?

**JINLONG:** Thank you, José. Bioeconomy, in particular, non-timber forest products are of great importance to people’s livelihood, rural economy, cultural heritage, community engagement, and forest biodiversity conservation. Their importance varies greatly in terms of regions, because China is a big country. China, one of the major producing countries of NTFPs, has a rich and diverse experience in using forest-gathered products other than wood.

**JINLONG:** In Northeast China where temperate conifer forest dominates with similarity of forests in north European and Canada, rich of wild mushroom and all kinds of nuts. Southwest China, close to Myanmar and India, very mountainous region, resident of minorities, with colourful forest related cultures, well known biodiversity hotspot, are famous for all kinds of mushrooms, medicine herbs, and forest-related food and industrial biomaterials, like bamboo shoots and resin.

**JINLONG:** Since Xia Dynasty, about 4000 years ago, China has started to cultivate mulberry and raising silkworms.

**JINLONG:** Religious land and Fengshui forests in China also reflect a rich spiritual and cultural connotation. Trees in China were originally associated with burial places such as graveyards and cemeteries. It is hard to talk about a particular typical kinds of bioeconomy products related to traditional forest-related knowledge, but I would like to cite medicine herbs and tung oil as an example.

**JOSE:** So, we have covered already the traditional knowledge stage, and what about the after the forest tenure reform in 2003?

**JINLONG:** We are not just going to use forests for timber, but use the space under forests. So we call it underplanting, under the forest.

**JINLONG:** I also categorised in four terms: (1) under-forest planting, (2) under-forest domestic animal raising, (3) collection and processing of under-forest products, and (4) forest landscape utilization (ecotourism).

**JINLONG:** Now the concept of payment for ecological products has been accepted by local governments in China.

**JOSE:** And what are some of the social and economic impacts of the production of these products? What are some of the challenges and prospects for the developments of NTFPs?

**JINLONG:** Development of NTFPs without enough policy regulations may exceed the restoration capacity of natural ecosystems and cause damage to the ecosystem, resulting in environmental problems. Over the past hundred years, Chinese society has gone through two different periods of planned economy and market economy influenced by globalization after opening up at 1980s, Chinese NTFPs supply chains have changed from being based on informal rules to formal institutions.

**JINLONG:** In recent years, Chinese policymakers are paying more and more attention to the role of forests in environmental management. In China, NTFPs are no longer just commodities, the development of NTFPs has been treated as a strategy or policy to protect forest resources and advance the growth of rural communities.

**JOSE:** Thanks, Jinlong.

***KEY TAKEAWAYS***

**JOSE:** So, Ida, what was new for you today? I, for instance, will be using the concept incumbent inertia from now on.

**IDA:** It is amazing to hear how diverse products and uses forests provide to people in different parts of the world. It is promising to hear how value-adding activities help local economies and provide livelihoods in rural areas. For me it would be interesting to see/investigate what effects these new value chains have on equity and who is profiting in the end. And then I got really hungry from hearing about all the tasty foods. Acai and mushrooms are some of my favourite foods.

**JOSE:** Thanks, Ida, for cohosting today. Thanks to our guests and to you, our listener. And listen to *Branching out* wherever you listen to podcasts. Rate and review us. Next time, we will explore the topic of forest biodiversity and its ecosystem services.

And check out more content from IUFRO at [iufro.org](https://www.iufro.org/) or click on the link in the show notes.

*Outro*