

Jerusha Klemperer:

We can see the causes and effects of biodiversity loss all around us. Only one variety of banana or pineapple for sale in every grocery store. Or the miles and miles of corn and soy you pass as you drive the roads of Iowa, Minnesota, Illinois, or the windshield effect that there are far fewer dead insects on our windshields as we drive those country roads. Biodiversity refers to the awesome array of life on earth, everything from microbes to insects, to plants, to animals, to entire ecosystems. We're right now in what's being called a biodiversity crisis in terms of the number of species we're losing and the increasing pace at which that loss is happening.

The primary driver of species loss is our global agricultural system: in other words, the way we grow our food. And as we lose those varieties and breeds of animals and plants, we don't just lose their genetics, we lose their unique tastes and flavors, too. I'm Jerusha Klemperer and this is What You're Eating, a project of FoodPrint.org. We aim to help you understand how your food gets to your plate and to see the full impact of the food system on animals, planet and people. We uncover the problems with the industrial food system and offer examples of more sustainable practices as well as practical advice for how you can help support a better system through the food that you buy and the system changes you push for.

Preeti Simran Sethi:

Several years ago, there was a group of scientists that analyzed 50 years of data on what 98% of the world eats. What they found is through globalization, we do have access to diverse foods like I'm sitting in Washington DC and I can go to my grocery store and find mangoes and jícama and all these things that maybe don't grow right here in the district. But what the global trend is, is towards sameness, and it's the same type and same amount of foods largely due to processed foods, but it's wheat, rice, corn, soybeans, and palm oil and potatoes. I'm Preeti Simran Sethi, I'm the author of Bread, Wine, Chocolate: The Slow Loss of Foods We Love, which is a book about the loss of agricultural biodiversity told through bread, wine, chocolate, coffee, beer and octopus, and through the lens of flavor. If you look at any of our processed and ultra processed foods, you'll find that sameness there or if you walk down a grocery store aisle and it will look like variety, but 90% of our dairy products come from one breed of cow, and that's again, because of yield.

If you start to think about like, wow, every time I look at ice cream, yogurt, milk, cheese, this is what I'm seeing, it's sameness. Then you start to understand why things are in peril because we are putting, literally putting all of our eggs or whatever, metaphorically putting all of our eggs in one basket. The breed of dairy cow all of a sudden gets an illness and all of that gets wiped out. And that's literally what we've seen happen before with wine grapes, with bananas, with wheat, with wheat rust, with coffee, with coffee leaf rust. There are all these diseases that are cropping up as a result of climate change that will make certain foods even harder to grow. And this warning has been coming over time, but is only getting worse.

There was a research study that was done by the Food and Agriculture Organization back in 2019 that looked at biodiversity in food agriculture, and what those researchers found was that of the 6,000 plant species that are used for food, only nine, nine out of 6,000 account for two thirds of the world's crop production. One third of global fish stocks are over-fished. Most of our milk, meat and eggs come from, again, just a handful of animal species and more than one fourth of 8,000 local breeds of livestock are now at risk of extinction. I'm not trying to be alarmist here, but I want people to pay attention. I want people to understand that what's happening is something that we really need to pay attention to because it is directly connected to our survival.

Ricardo Salvador:

I think it's first of all, important to understand the type of diversity that we're talking about when we say biodiversity. Obviously we're talking about a type of wealth, and the reason why most of us would need to have biodiversity explained to us is that very few of us are conscious of how dependent we are on living things other than ourselves on this planet. But without other living things ranging all the way from microbes to plants, we would not be possible as a species. I'm Ricardo Salvador and I am an agronomist and I am the director of the Food and Environment Program at the Union of Concerned Scientists based in Washington DC. We've been losing biological wealth. That means the number of species across all of the different kingdoms, the plant kingdom, the animal kingdom, and in the world of microbes as well.

Formerly, our population numbers were low, our technological capabilities were small, so our ability to really threaten the buffering capacity the planet against the damage that we do as a species that basically appropriates resources, denudes resources, exploits resources, was really quite small until this explosion of our capacity to really affect our world, our planet. And so we've diminished biodiversity primarily because we think we're becoming more efficient, that we're being more thorough in extracting the resources that we need to sustain our modern lifestyles. We have specialized, we have mechanized. Both of those things have been put together in a process which economists call industrialization in which we have minimized the number of parts and resources that are required to put together the things that we need.

Ryan Nebeker:

When we talk about the biodiversity crisis, there's two important components as it relates to agriculture. There's agriculture's impact on wild biodiversity, and then there's biodiversity within agriculture itself. My name is Ryan Nebeker and I am the research and policy analyst for FoodPrint. For that first one, agriculture has a pretty deep and wide footprint on the land. It uses up a lot of land and it uses that land very intensely. When you're doing something like growing a really chemical intensive corn crop, you're using a lot of pesticides that help knock out the neighboring insect populations. You're using a lot of fertilizers that change the soil chemistry and really alter the microbial community that can live there. You're altering the chemistry of the water that field drains into that impacts the number of species that can live there. As the footprint of agriculture gets wider, these impacts on wild biodiversity around it grow, and so the number of species that the environment is able to support drops.

But the second part of the biodiversity crisis as it pertains to agriculture is within agriculture itself. When we think about foods that we want to see in the grocery store, people are looking for consistency. That means that they want the same banana every time. And so as a result over the last several thousand years, but then really intensely over the last 100 years or so, we have narrowed down the number of varieties of crops that we grow, and particularly as the seed industry has turned from something that farmers were... Farmers used to keep most of their own seeds, and you would have tons of regional varieties or land races as you call them, of various crops.

The corporatization of the seed industry means that they're now producing the seeds every year and people are just buying them. Let's say you're looking at a tomato, it might produce a smaller tomato or it might be pretty inconsistent, but that ugly inconsistent tomato might have some genes that help it resist insects far better than anything that's on the market right now. But if that tomato just falls out of use completely and we lose it, those genes are gone. And that applies to a lot of plants.

Ricardo Salvador:

The real question with biodiversity in my thinking is whether we will realize in sufficient time that we need to halt and reverse our diminishment of the wealth of biological species on this planet so that we're able to sustain the human prospect on this planet. If we're not able to do that in good time, then we really have limited the viability of the human species on planet earth. Biodiversity is an existential question for human beings. It's a bit of an IQ test. How smart are we? Do we deserve to actually live on the planet? There's pretty good psychological research that shows that for human beings, we prioritize immediate threats in terms of our decision making process. As long as the threat is conceptual or is abstract, it might as well not be real to us. Our economics, our psychology, our policies are all geared to respond to the short term. And so I think we will be forced to get wiser about biodiversity once it is clear that there is an alternative that really does pose a threat to the viability of our species.

Jerusha Klemperer:

One aspect of biodiversity loss that might get people's attention is how it affects our personal health. I asked Dr. Urvashi Rangan, chief scientist for FoodPrint, about how that lack of diversity in what we're planting and eating affects our bodies.

Dr. Urvashi Rangan:

What is diversity in the diet and why is that important? It's because that impacts our own biome in our own guts, and the biggest benefit you can bring to advancing your own personal biome, your gut biome, your gut health, is by eating a diversity of fresh foods and a diversity and a variety of different plants, vegetables and well-produced dairy and meat products, that that will actually raise your biome because your biome wants that diversity. The more diverse a biome is, the healthier it is, and the way to achieve that is by feeding the biome a diverse diet. Even though we're feeding ourselves, what we've learned in the last couple decades really is that we're actually feeding a biome too, and fiber is not like an inanimate thing that just passes through us and cleans us out. Those bacteria in our gut actually eat that fiber.

That's their diet. It's called a prebiotic now sometimes, and we're learning so much right now about all of that, but there's no question that more diverse diets increase your biome and less diverse diets harm it, and processed food diets are really at the bottom of that list. That's what we're seeing right now. Now, what will that do? We're starting to understand the relationship of gut health to a variety of different things, to mental health, to nervous system health, to cardiovascular health. The gut is connected to so many different things, and it is likely going to be foundational to our overall health. It's pretty new information, and we are just really getting a handle on all of it at a microscopic level.

Jerusha Klemperer:

She also explained that the food is becoming less nutritious thanks to the diversity loss in our soils.

Dr. Urvashi Rangan:

In the last few decades, there's been a lot of research on the health of people. Why are people getting less healthy? And as part of that discussion, there's been a lot of research into the nutrient density of food and trying to determine, why do we start to see declining levels of nutrients in food? And so for the same amount of calories, why are people getting, actually, less than we did say 30, 40, 50, 60 years ago from food? And there seems to be an empty calorie problem where we've got the calories, we're

producing the food with artificial fertilizers, with synthetic pesticides, we're producing it, but the question is, what are we doing on a microscopic level that is compromising that food? We try to put in fertilizer as the artificial way of adding nutrients to the soil. The problem with that is the more fertilizer you put in does not amount to the more nutrition you get out of that food. It doesn't work that way.

Nature has what we call a homeostasis or an equilibrium that it can't be exceeded, so you can dump as much as you want to, but that's not going to yield the effect you want. And industrial ag now knows this because they dump a bunch on and then a bunch would run off the farm because it wasn't taken up. Then we have runoff and pollution problems from that, and that's yet another huge environmental problem that affects biodiversity. The answer really lies in not using chemistry to address all these issues, but rather using nature and the power of nature and its ecosystem and to cultivate that in order to take care of these problems. When it comes to nutrient density, you have this, in an ideal situation, a soil biome that is thriving, it's got microorganisms, it's got insects.

There's actually a fungus that even goes to get minerals out of rocks. There's even that going on in a really healthy soil system. And all of this is talking to the roots of the plants and bringing all of these nutrients to the plant. There's this whole world going on underground. When you douse it in pesticides and fertilizers, this world doesn't really exist, and if it does, it's very crippled. There is no question that biodiversity at every level is correlated to nutrient density, and we are dealing with the current crisis of losing nutrient density in food. And the way to solve that is not by dumping more synthetic fertilizer onto crops. The way to change that is to increase the level of diversity that exists on all levels of the farm, and that is actually what is going to lead to the greatest uptake in nutrient density that you can provide.

Jerusha Klemperer:

There are ways of farming that avoid these pitfalls, of course.

Ryan Nebeker:

One of the big approaches that we talk about is called agroecology, and this sometimes gets folded under the umbrella of regenerative agriculture too. But agroecology focuses on not just planting seeds, growing crops, take the crops out. It focuses on building this kind of functional ecosystem on the farm that mirrors an ecosystem you would see elsewhere. You are doing things like creating more diverse habitats. You're planting different shaped plants together to provide lots of little environments for things like beneficial insects and birds that will help keep your pests in check naturally lowering the load of work and chemical use that you have to do. Making all of these tweaks just to lighten that footprint, bring a little more wild nature in, not harming it quite as much with the things that you're taking out of the farm and trying to mirror the loops that we see in more natural ecosystems.

And so that's a really important approach, particularly when we think about the alternatives. If we are raising beef cattle, for instance, animal agriculture on an industrial scale and its expansion is really the main driver of biodiversity loss within agriculture. We're taking some of the world's luscious, most biodiverse environments on earth like the Amazon or wetlands and turning it into low quality grazing land, or even worse corn and soy production to feed animals. If you took that system and raised a lot less cattle and made it into a more functional pasture with diverse forages that was able to support birds and insects, you'd really be lightning that load dramatically.

Dr. Urvashi Rangan:

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In an ideal farming system, you would not be applying any harmful chemicals onto that farm. You would try to use the biology that exists there to do that. And what do I mean by that? It means that actually when your soils are healthier, again, you're in this biological balance between good and bad, and the good can actually take care of the bad, and that includes massive pest infestations, for example. When you cultivate that, it actually allows the environment around it to start doing some of that work, that then you don't have to apply a chemical synthetic to control that. When you plant diverse crops and crops in rotation, you also create a way to manage weed control. You also create a way to inject more natural fertility into the soil. We need to flip that whole thing around and start with, well, how do we cultivate the biology of everything? And if we did that, we would solve a lot of these current problems that we have in agriculture, in biodiversity, in nutrient density.

Jerusha Klemperer:

Those answers to how we cultivate the biology of everything can be found in indigenous communities. Researchers have found that while Indigenous people are just 5% of the global population, they're protecting 80% of the world's remaining biodiversity. And that looking to traditional ecological knowledge can be a way to understand how to live in better relationship to the environment and protect what remains of our biodiversity.

Rowen White:

Humans have been tending to agrarian lifestyles for over 10,000 years. But if we look on that timeline and see where the introduction of a more industrial uniform streamlined commercial production of food, it's a very tiny blip on that timeline. It's only been in the last couple of 100 years that we've seen the value shifting and the mechanisms for food production really shifting. And inside of the colonial industrial food system uniformity is king. But prior to that, for the millennia that humans have been engaging in agricultural endeavors, we've all known that diversity is the key to our resilience. My name is Rowen White. I come from a small Mohawk community, right on the New York Canadian border, it's called Akwesasne. We have a very unique situation where we straddle the international border. Part of our community is in Canada and part of it is in the United States.

I am a Seed Keeper and a farmer. I am the founding member of the Indigenous Seed Keepers Network, which is a project of the Native American Food Sovereignty Alliance, as well as my own home farm here, which is Sierra Seeds, which is a farm that's essentially dedicated and devoted to cultural biodiversity, to stewarding seeds that have stories, that have lineage, that have legacy, and to growing that next generation of seed stewards inside of that sort of cultural and spiritual framework. In my work, I advocate for a relational food landscape where humans understand that we're in a reciprocal relationship with food, seed, land, water, all of our elements in the natural world. But I think there's a significant worldview shift that's happened in the last couple of 100 years around capitalist agriculture and colonial agriculture that establishes human dominance over the landscape and creates an environmental catastrophe, which is now culminating into the climate chaos that we're seeing in the current moment.

And so I'm always advocating that in order for us to shift the larger narrative in food systems work, this is cultural work. We have to understand our place as humans in the ecosystem of agriculture. And that when we began to see ourselves in a reciprocal relationship with seeds and food, that we begin to shift the narrative and understand that it's not just a successful agricultural season is not just top yield for humans, but it's actually that there are so many beneficiaries of a successful agricultural crop, which means pollinators, the wild fertile edges, humans included, the soil healthy waterways and all of that.

I come from a long line of indigenous farmers. Mohawk people, we are agricultural and agrarian. We have a longstanding tradition of working in reciprocal ways with the land. But as a modern day Mohawk woman, as we all know, we have had many instances of cultural upheaval in the last several centuries. Most recently being that my family was deeply impacted by the residential schools. My grandparents were taken away to residential schools and stripped of their language and culture just in this last century, and that had a huge impact on my family's legacy and stewarding the land. My great-grandparents were farmers. My grandparents grew up on a farm, but my generation wasn't raised on a farm because of the impact of residential schools. But all growing up, I had a great interest and curiosity about the natural world, about where our food comes from. There's just this curiosity, planting pumpkins with my mom in the backyard.

My grandparents always saying that that was my great grandma Marina, or my great grandma Anna's brilliance, ancestral brilliance coming through again. And so when I left home at 17, I ended up in a small liberal arts college in Western Mass, which was Hampshire College that had a working farm on the college campus. And it was at that point in getting my hands in the soil, working with seeds in the hoop houses and in the gardens, that I fell so deeply in love with seeds themselves as well as the cultural and spiritual legacy of those seeds. And that was a real cornerstone moment of me recognizing that this was going to be my life's work: to care and tend to seeds as well as the cultural context in which seeds have evolved in. I had a moment in time where there was a previous student who had created a project at the farm that was looking at the diversity of heirloom tomatoes.

It was an heirloom tomato project, and there were tomatoes that were not only just round and red, but fuzzy pink peach tomatoes and striped green and yellow tomatoes. And for this 17-year-old woman to just... My mind was just so enthusiastic about the breadth of diversity that existed that I never knew was there growing up eating tomatoes out of a can or perhaps occasionally out of the garden. But I didn't understand the prism of colors and flavors. But the other piece was learning about these particular, there were 50 varieties in the heirloom tomato garden. And my curiosity was piqued at how each individual tomato variety not only had these unique physical characteristics, but they all had these stories of where they came from. Families that had taken them from Italy and brought them across the Atlantic Ocean, ending up in Ellis Island, sewn into coat pockets, and that people were carrying these seeds because it reminded them of home.

It reminded them of their family, of their cultural lineage. And so it began to open this doorway of inquiry for me that not only was there biodiversity, but there was this cultural dimension of biodiversity that people and plants had co-evolved over millennia with this deep, deep commitment and connection to one another. And I began to ask the question, as someone who is Mohawk and who knows that so much of our culture and ceremonies revolve around our connection to agriculture and our foods, our traditional foods, I began to think what were the seeds and foods that fed my ancestors, and why weren't those seeds passed down from generation to generation?

Jerusha Klemperer:

It's not just a scientific loss or a biological loss. What else do we lose when we lose seeds?

Rowen White:

I came to ask this question of, what were the foods and seeds that fed my ancestors and why wasn't I handed those seeds down, and those stories and that cultural memory of those seeds and the understanding of the flavors? And so that's that question that I ask everyone in this space is that, "You all descend from a long line of people who had storied, embodied beautiful connections and relationships

to seed and land and food. And at some point in your lineage that was severed from you." We all know that when we gather around the dinner table and there's a sense of connection and care to the foods that are there, oh, my grandmother used to cook this dish and this flavor I remember from being a child. Those are such important aspects of a good quality of life as a human on earth that we cherish that.

That's what people love about food, is that there's a multisensory experience that reminds us of who we are and who we belong to. And so part of this is when we're losing varieties at a rapid rate, we're losing a sense of who we are ancestrally across the globe. And we're losing that sense of care and connection and belonging to diverse food lineages and legacies that I think help us to have a higher quality of life in their current moment. And as an indigenous woman living in North America, that's part of my commitment to food systems' revitalization, is to bring that conversation into the center. It's to say that our ancestral connection to seed and food has a place here at the table when we're talking about food systems revitalization in North America.

Jerusha Klemperer:

That's so beautiful. And when you describe it, I really see this thread, this seed thread connecting the past to the present and then to the future, and what we owe the future generations to keep this alive.

Rowen White:

Because that's part of being a good future ancestor and a responsible descendant. For me, it's taking a bundle, a bundle of memories, a bundle of skills, of lessons and wisdom, and making that bundle better than when you received it. For me, as a Mohawk woman, I came into this work not knowing my language, not having a collection of seeds that came from my ancestors, but I made a commitment to work diligently, to talk with elders, to bridge that generation gap as a young woman. And to go to those elders and say, "I care deeply about what you all have done amidst great cultural upheaval to keep these seeds alive against all odds." That they kept these seeds alive through the residential school era, through the land displacement and the reservation era through many different moments of cultural upheaval.

And so we as a younger generation have a commitment to bridge that generational gap to the aging and elder farmers who have kept these important heirloom seeds alive. That we will be that generation who didn't forget our commitment to that lineage and legacy, and that we commit not only to caring for those seeds in our lifetime, but to grow that next generation of seed stewards for years to come. And that for me, in my own microcosm of my own family, is that I've begun to heal that severing of us from the land in one generation. I did not grow up on a farm. I did not grow up eating ancestral foods because of that impact, but my two children who are now 16 and 18 have grown up, always growing up on a farm, always knowing the flavors and colors of their ancestral foods from home. And so it's just in one generation that we can repair that connection. And it's hopeful. I think we live in a world where there's so much grief and despair.

I don't think there's a single person here who's untouched by the grief of disconnection from their cultural memory, their ancestral food heritage. And so this work of what we're calling "rematriation," of reconnecting people to seeds and seeds to land is healing, and it's helping us to grapple with the grief of living in diaspora from those cultural food traditions. I think it's important to remember that for every single Indigenous community that exists on Turtle Island, what we call North America, that there is a unique collection of seeds that is specifically adapted to that very specific micro region, that climate that exists in that particular area. Those are what we would call land race seeds. Seeds that are born of a particular place that have evolved over generations with specific attributes and abilities to survive in that

unique environment. And so that's where you have Hopi corn seeds that can be planted like a foot deep in the sands of the desert that sprout and make corn every year with very little water.

Or you have corn varieties from my community that are bred to withstand floods and big rain events and all of those things. And so I think it's important for us to remember that locally adapted culturally significant seeds are a critical part of any durable, sustainable local food system. Prior to colonialism coming into North America, there were hundreds if not thousands of unique bioregionally specific agricultural systems that existed all over the continent. And having an agricultural system that had seed stewardship inside of it, it was inextricable. There was no such thing as a seed company. It's really important for us to remember that 200 years ago in North America, the concept or idea of a seed company didn't exist. Gardeners in this time and place, if you think about planting a garden, you immediately think, "I need to order my seeds from somewhere else and get them and they ship to me, and then I plant them in my garden." But seed stewardship prior to that was just such an ingrained part of an agricultural life way.

It was... seed stewardship was just an inherent part of every garden and farm, and you were saving and selecting seeds that were a part of that particular place, of your particular desires for certain colors or certain flavors or the plants that did the best in that particular environment. And so part of me being a seed advocate and advocating for seed sovereignty is to reconnect and rehydrate that part of agricultural systems is bringing seed stewardship back into our farming systems. But doing it in a way that is culturally appropriate and that plays into a larger movement, the indigenous food sovereignty movement, which is Indigenous peoples, reclaiming our connection to land and to food and to culturally significant seeds because we know not only when we eat those seeds are we healthier in mind, body, and spirit, but it helps us to continue to renew our cultural commitment to those seeds because they're a part of our bigger creation story and cosmology.

Preeti Simran Sethi:

The loss is really not just what's out there, but it's also really what happens within ourselves, within our cultures and our community. And what I mean by that is I think many people might be able to recall a connection to food that transcends just caloric nourishment. It's not just about what we need for energy, it's about our humanity. It's about a meal that someone we love made for us, maybe a recipe from our grandmother or a story that's been passed down over time, a ritual that happens every Passover. Or remembering someone making soup for us when we're feeling sick or taking us out for a meal to celebrate. And I wanted to touch into that preciousness in what I wrote, but I just also wanted to remind people that the loss of agricultural biodiversity isn't limited to soil, seed, pollinator, plant, fish, animal. It's also a loss of story and identity in who we are.

And when we erase diversity and make everything the same, homogenize everything, that's what we start to erase. There is a preciousness in flavor, in place, in culture to the foods that we eat. And celebrating and honoring biodiversity is a way to reclaim and sustain that. At one point, my book was going to be called Endangered Foods, and I was going to also tell the loss of biodiversity instead of through bread, wine, coffee, chocolate, beer and octopus, but through rice, corn, potatoes. And part of me was like, okay, Michael Pollan wrote such a great chapter on corn, so I'm probably not going to be able to top that. But then more importantly, I don't love that relationship to corn. Coffee wakes me up in the morning and sets the tone of my day. Wine is a substance used for celebration. Chocolate was like my every birthday cake and my wedding cake and what I ate to get through my divorce.

And this was like pleasure was at the center of so much of this. And my sister even turned to me at one point and was like, "Oh, you're going to talk about all the sin crops!" And it was really that idea of like,

yeah, this is about celebration. This is about juiciness. This is about savoring. We save these foods and drinks, we save biodiversity through savoring, and I don't think I need to necessarily dissect pleasure, but what I want to say is so much of environmental engagement. I've been an environmental advocate for my life and an environmental journalist for decades. And a lot of things felt scarce like, don't do this, stop this. But here, what I'm inviting people to do is savor deeply, is to be grateful for what we have. When I talked to those researchers who shared that bottleneck of what we're eating now, just a handful of crops, which is now known as the Global Standard Diet, I asked, "What should we do? What's the alternative?"

And I was really worried that the answer was going to be like, okay, well, you have to eat this one esoteric rice to solve the problem. But what I was told was just get out of that handful of foods, wheat, rice, corn, soybean, palm oil, get out of that. Olive oil, get to the other aisle in the grocery store, go to the farmer's market and pick up something you haven't tried before. Choose a craft beer brewed locally over a Bud Light. Do you know what I mean? That these solutions are pleasurable. Everything doesn't have to be hard. And if we really turn toward joy and gratitude, and also I'll add, when I say gratitude, I really mean reverence for the supply chain, gratitude for the stewards of biodiversity, gratitude for farmers, especially small scale farmers that are upholding this biodiversity. Growing all the things you're not going to find in Safeway or Food Lion. The tomato that is never going to be shelf stable, that precious heirloom tomato that needs to be held carefully. That peach grown in season.

The stewards that are keeping pollutants out of the soil and working really hard to do so. Celebrating them and understanding that what we need to be focused on. Sometimes people are like, "Well, gosh, what you're really saying is people need to pay a lot more money for their food. That's really elite." And what I come back with is, we need to be paid a wage that supports honoring and compensating people for the work that we do. And I'm pretty unapologetic about that because the people getting squeezed aren't the CEOs, the people getting squeezed are some of the poorest people in the world are small holder farmers are fast food workers, are people who work in meat packing factories who are part of our food chain. But the people who are hungriest in the world are the people who work so hard to get us our food. I think it's really important that we start to upend this idea that everything should be cheap. And part of that for me is coming back to where does this come from? Who grows this? How and where has it grown and what does it taste like?

The reason that I encourage people to support farmers in a farmer's market or support some of these craft chocolate makers or specialty coffee purveyors is they are committed to flavor and to understanding the supply chain outside of an industrial model. If it's a local farmer, it's like you may be having direct contact with this person who has grown your food. That intimacy in a relationship is priceless, but it's also supporting our local food systems and it's supporting growing foods in our food shed in season. And supporting the flavors that come out of that, supporting the diversity that comes out of that. If we look to some of those foods that don't grow like in our backyard, like cocoa or coffee, it's a way of starting to understand the preciousness and importance of supporting the people who do grow those products. The farmers maybe that are growing coffee in Ethiopia where coffee originated. What does it mean to support farmers there?

And the way that supports biodiversity, I should make clear, is that when we see all these forces that are basically eroding biodiversity, so climate change, pests and diseases, our changing diets, we're going to need to come back from that. We're going to need to breed maybe different traits into a coffee bean to make sure it can withstand higher temperatures or droughts. How do we do that? Well, we go to the place where most of the biodiversity is, and we source from those crops, or we source from the relatives of those crops, what we call crop wild relatives. We don't just need that one coffee plant that we keep

growing. We need all of their relatives, and we need diverse coffee plants, so we can pull from those plants, pull the traits from those plants, and keep the coffee crop going.

The place where coffee originated, as one example, often tends to be the place where these crops have the most diversity. And in the case of coffee, it is both in the same places, Ethiopia. We need those farmers to keep sustaining that crop. We need to support those farmers. We need to honor that land, and we need to support the coffee roasters that are sourcing from those places, so we can not only have those amazing flavors, but we also need to sustain that diversity, so we have all varieties of coffee in the future.

Jerusha Klemperer:

The crops are industrial system favors now we're not selected for taste or for climate resilience for that matter. They were selected mostly because they were easy to grow and transport at a very large scale. And for most of us, it's hard to know what we're missing. In her book, Sethi focuses a lot on taste and flavor. And for each chapter about the different foods, she ends with tasting notes as a way to help readers find and appreciate the nuances and products whose industrially produced versions just taste like themselves. Chocolate bars, drip coffee, red wine.

Preeti Simran Sethi:

And the person who's maybe new to wine who's like, "Well, I don't know. I like red." Or someone just being familiar with drip coffee and not having any sense of what the diversity could be. It takes a little work to get there and to start to detect some of those flavor notes. And sometimes it feels really like a a snobby pursuit. And what I really wanted to do in my book was democratize that. That person over there who says, this is the right thing to eat or drink, own what you love. And maybe it is the coffee you get at Dunkin' and that's also fine, but know why you love it. And maybe by starting to understand that you'll really appreciate all the diversity that's there. All this biodiversity does translate into diversity of flavor. I talked to over a 100 experts for my book, and the flavor experts all said, it really comes down to paying attention and developing a language.

If you've never thought about chocolate deeply, it might be really weird to be like, okay, what's in here? Oh, I'm sensing peanuts. Or, gosh, I think that's kind of jammy. Is that plums or is that raisins? And there are these wheels you'll find along with tasting guides in my book that will help give the language for this as a real way to start to understand what biodiversity can offer and is a real pathway to starting to make those changes. Every time we choose to support a local farmer, every time we choose to step out of the handful of foods that make up most of what we eat, every time we choose to even just simply remember and be grateful for what we have, every time we opt not to throw something away, we are already making changes and showing that biodiversity matters, social justice matters, equity for the people who grow our food and sustain agricultural biodiversity matter, and our choices matter.

Jerusha Klemperer:

Movements like Slow Food have been leading aspects of that revolution for a few decades now. The one where farmers and chefs partner with eaters, what Slow Food calls co-producers, to save disappearing foods by creating a demand for them and by leading with taste and flavor. The description of breeds and varieties that started showing up at farmer's markets and on menus a few decades ago were part of a strategy to revive and nurture heirloom tomatoes, forgotten peppers and slowly disappearing livestock breeds.

Rowen White:

The thing that unites all of us is that we all eat multiple times a day. Let's lean into this idea that no matter what cultural community that we descend from, that each cultural community had its own unique agreements or covenants with these particular plants that gave up a little of their wildness. Plants gave up a little of their wildness, and humans gave up a little of their wildness to come together in this agreement that's called agriculture. That's what agriculture is, is we kind of domesticated each other to be in this reciprocal relationship to care for one another. And what I like to remind people is that the plants never gave up on their agreement to take care of us. If you ate today, the seeds never gave up on their commitment to continue to make sure that humans were cared for and nourished. But what has happened over time is that many humans have forgotten their care and commitment for seeds and being in that reciprocal relationship.

And so we all have a commitment to care for seeds in some way, and some of us have green thumbs, and some of us are good at growing seeds in the garden, but some of us are good at storytelling. Some of us are good at teaching, some of us are good at advocating and creating policy. There's so many ways that we can advocate for a more sane, kin centric, meaning kinship centered, relational food system. And we need, at this point, all hands on deck: people from many different professions and backgrounds and cultural communities to advocate for seeds and what they've continued to do for us across time. Because we are in a crisis, we know that our ability to adapt to an ever quickening changing face of mother Earth is so critical. And as we know, there isn't that much time. We have a shortening window to be able to remedy the impacts of climate change and climate chaos.

And so the reason why I emphasize that particular fact is that that's not just indigenous people in North America, that's indigenous people across the globe having a cultural context for which diversity is cared for and stewarded. And so that's that cultural shift that needs to happen across the globe, and that's why I continue to advocate for Black, indigenous and other bodies of culture to show up in spaces where agricultural policy and change is happening. Because we have an understanding of what practically what it means to steward agricultural biodiversity that is critical to the sustainability of any food system across the globe. There's all kinds of places and spaces where seed literacy can be cultivated, whether it's restaurants or classrooms or through video and film, through art installation. There's so many ways where we can increase seed literacy amidst the wider population that will help contribute to the cultural shift that needs to happen so that we can reintroduce diversity as a core value in food systems change in North America and in the western world, and begin to make... Create continuum for the continued change.

We know that the local food movement has been growing over the years. When I started this work and was learning about heirloom seeds and the importance of agricultural biodiversity, the word heirloom tomatoes wasn't a household thing, and it is now. We've seen in the last couple of decades that there have been cultural shifts. And so part of this is just leaning into creating more seed literacy so that people advocate with their food dollars, advocate with all the ways that we vote for change in our lives so that we feel like we have agency to actually make those changes within our lifetime or perhaps our children's lifetime.

Preeti Simran Sethi:

The last trip I took before the world kind of shut down was actually, on the invitation of the Svalbard Global Seed Vault, a trip to what's known as the Doomsday Vault. It's this vault under permafrost where the backups of seed collections are stored. And the idea was when it was created that it would be something hopefully that we'd never have to open up. And I just remember the deep gratitude I had and

still have for the researchers and scientists who preserved biodiversity in these stored collections. We store it in basically three ways in these collections with farmers growing these crops, and then also in the wild just growing. One of the things I write about now are psychedelics because I have worked with psychedelics for depression and anxiety, and part of my depression has been out of the heartbreak of the fact that people still don't seem to be understanding the urgency of biodiversity loss, the urgency of climate change, and the need for us to really think about what we're doing.

One of the places where we can have the biggest impact is on our plates. If we're lucky enough to eat, this is something we do multiple times a day. It is my fervent hope and prayer that people start to understand this is such a powerful way to make change, because I'd love to tell you my book had a big impact, and all of a sudden the world has changed. But the truth of the matter is it hasn't and it won't until we start making much stronger decisions in support of a different kind of food system. There absolutely has been an increase in awareness of the importance of local foods, an increase in the importance of seed saving and growing your own food. I was so delighted., horrified, of course, that we were in a global pandemic, but delighted in one of the outcomes that I actually wrote about, which was there was all of a sudden a run on seeds because people all of a sudden realized store shelves could be empty, and that we really needed to start to think about what it would mean to grow our own food or get more intimate with our food supply and understanding where food came from. I think in tandem with this biodiversity loss is a greater interest in what is happening, but what I'm trying to say is it's not happening fast enough. And so we need to really start to rethink where we're allocating our attention and our money and our time.

Jerusha Klemperer:

There are roadmaps for how to get there. The 2022 UN Biodiversity Conference came up with global targets, including effective conservation and management of at least 30% of the world's lands and waters, restoration of at least 30% of degraded land and water ecosystems, and reducing by half the amount of chemicals and pesticides we used to grow our food. And the UN Food program described additional specific changes we can make to the food system, switching to a more plant-based diet to avoid habitat destruction for animal agriculture, and shifting the way we farm away from monocultures. But these are only roadmaps and they need to be implemented.

Ricardo Salvador:

If we continue to think of ourselves as self-interested competing groups of people on this planet, and we do not work together to solve the question of how can we create dignified sustainable life cycles on this planet where we don't boil ourselves to death because of thoughtlessly continuing to develop technologies that are inimical to our viability on this planet, then we will deserve what happens to us. The problem to solve is how to collaborate by seeing all of us as one single human species, no nations, no boundaries, no artificial differences between us, all of us having the common interest of surviving, surviving well, and surviving in a dignified, equitable way on this planet.

Jerusha Klemperer:

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