Interview with Dorn Cox
Farmer
March 1, 2023

Dorn Cox: [00:00:00] To manage the complexity of a diversified farm, or any farm really, is a shared human endeavor. The quote I like, I think, is Howard Buffett and it said, "Every farmer has 40 seasons to learn and to get better." But if you have a thousand farmers, you've got 40,000 years that you can start to build on. And if you think about that generationally or globally, the pace at which we can learn and apply that knowledge really accelerates. So that's what gives me hope.

Announcer: This is *Frontiers of Commoning* with David Bollier.

David Bollier: My guest today is Dorn Cox, a farmer who has long been in the vanguard of regenerative agriculture and open-source technologies -- two ideas rarely spoken in the same sentence. He's also a big champion of participatory science and knowledge commons to help improve agricultural practices.

Cox just released a fantastic new book that synthesizes all of these topics in a highly [00:01:00] readable way. It's called *The Great Regeneration: Ecological Agriculture, Open Source Technology, and a Radical Vision of Hope*. With a deep background in earth system sciences and a PhD in natural resources, Cox is a man of the soil, and the computer and science. He farms with his family on 250 acres in Lee, New Hampshire, and also serves as research director for the Wolfe's Neck Center for Agriculture and the Environment in Freeport, Maine. Cox is also a founder of the Farm OS software platform and Farm Hack, an open-source hardware project that designs and builds agricultural equipment.

He's also helped develop the open technology ecosystem for agricultural management, called Open Team, which is a farmer driven, collaborative community dedicated to improving soil health and addressing climate change. Welcome Dorn.

Cox: Thanks David for that lovely introduction. It's really great to be here with you.

Bollier: Let's start with an outline of [00:02:00] your general vision, Dorn. So much technology has been used in ecologically destructive ways or at least in the service of big agriculture. Why do you think that a new regenerative and localized path for agriculture could be forged with open-source technology?

Cox: It's a great question, and I think it's particularly interesting because so much of the technology we see now that's moved so quickly has been a byproduct of industrialization or we often create attribution to the technology that we're using as a byproduct of industrialization.

That's, I think, an important clarification. But really what I'm interested in are the tools that we're using, not just for how rapidly we extract, but how we experience the environment. And there's been

a really rapid increase in our ability to understand the context in which we live and redefine how we see ourselves in the environment and how we work together.

And that's really sort of the foundation of agriculture. It's the way in which we [00:03:00] express our understanding of the environment on the earth itself. It's translating our knowledge into action. And from that perspective, there's been a huge acceleration of our ability to understand the destruction that we've created on the planet and document that.

And unfortunately our ability to see that destruction has come after a lot of that destruction has happened, and that trend has accelerated. And the point that I'm trying to make here is that those same tools that are documenting the destruction can give us consciousness for how to switch that around. If we have the ability to comprehend these systems, then do we also have the ability and the duty to use that same knowledge to not only restore them, but to regenerate and create abundance in the natural world? And it's a question, and we have examples where people have expressed themselves in their environment as beneficial organisms.

So it's not predetermined that humans are an extractive species or a parasitic [00:04:00] species. We really have the ability to do both. And so that's what I'm looking at is if we have this choice, what are the ways in which we can harness our available tools to move in one direction versus another? That's the foundation of the conversation that the book begins to address and beginning to frame the concept of regeneration as an alternative to that other path – the extractive path that, again, we know so well, and we're living on a day-to-day basis with climate change and mass migrations, wildfires and floods, and destruction of global biodiversity.

Bollier: Well, before we get too far into this, maybe you could give a brief introduction to your life as a farmer. How did you become a farmer and what type of farm do you run?

Cox: It's interesting. So I grew up on my parents' farm. And my father went to school for agriculture at a time when organic agriculture was seen as backwards, but he stuck to it and was one of the founders of [00:05:00] the first organic organizations in the northeast of the United States.

I grew up going to some of those early meetings as a very young child, so that was sort of permeating my early days. But also then, I went back to school for agriculture and international agriculture. So really looking at agriculture as a means towards development. At the time that was at Cornell, it was at the end of a lot of the reflections on the failures of export-oriented, large-scale agriculture related to the Green Revolution. So that's what they were teaching and also seeing the failures.

So I had the experience both to see some of what was really being preached earlier in development agriculture around small-scale value-added production, building local economies, that was my own farm experience. And then being able to put that into a larger context through my undergraduate education. I think a unique moment when I left college they said, 'Well, [00:06:00] most of what we've been teaching you, we've learned has been somewhat counterproductive, so good luck and hopefully you can do a better job than we did.' It was sort of the sendoff that we got. You know, and you don't get that until you get to your higher-level courses.

In the beginning they're always telling 'this is the gospel,' and then we get into the real meat of it. And really the rest of my career in life has been really exploring a lot of that tension. So I went and spent about a decade in technology and finance to understand a lot of the forces that were actually influencing some of the extractive nature of industrial agriculture and development theory and then returned to the family farm and began my graduate work in natural resources in earth system science and really beginning to bring the global knowledge back to our own family farm operation and understand how can we create and build local, vibrant food economies in our own family operation first, and then begin to build relationship, [00:07:00] strengthen our local economies while we're connected to understanding the role of agriculture, not only in terms of stewarding our local environment, but again, it's a larger importance from a agriculture as a shared human endeavor. And I'll note that our family farm is also just two miles from the University of New Hampshire, which is one of the well-known centers for earth, ocean, and space.

So we have this, even in our location here, we have a really unique perspective in being able to bridge, rural and urban, local and global in experiencing some of these different tensions.

Bollier: So in some ways, you were born just in the nick of time to get the conventional industrial education about agriculture, but you were also exposed to enough of the new wave of small-scale regenerative agriculture. And then, of course, you have your own practitioner perspective as a farmer. So it seems that a lot of threads are coming together through your experiences.

Cox: Yeah, and I felt like especially having time away [00:08:00] in sort of the business side of agriculture for more than a decade, and coming back to the family farm and really diving in deep in practice and really grounding my work and my family's work and community in 'How do we apply the best knowledge that we can access to our soils and to our local ecosystem?'

So that was a really important time in my career, was working very closely with extension services locally and beyond to really apply a soil health management plan, to work with cover crops, to work with grazing management plans to experience, 'What are the challenges of trying to implement […] pasture on our own property and animal management and irrigation in drought periods and managing irrigation systems?' and all of those things that come with the physical nature of applying knowledge onto the land and recognizing that to do all of those systems are so complex that it became [00:09:00] abundantly clear that to manage the complexity of a diversified farmer or any farm really is a shared human endeavor because of all of the different elements in it. You know, if you're managing even an irrigation system, you're dealing with hydraulics and electronics and fluid dynamics and metallurgy, plus the natural systems in which you're trying to affect.

So it's just an incredible amount of technical knowledge, and it felt really unreasonable to think that any one individual or any enterprise could hold all of that. It really became clear to me to be successful it requires being able to build, and we are already, whether we're acknowledging it or not, building on generation upon generation of knowledge to do any of these tasks.

I mean, it's represented in every seed that we have. It's generations of selection that we're building on, and so that was sort of the core, I think, of an inspiration for so much of the work that got reflected in, in your introduction, projects like [00:10:00] Farm Hack and how do we tackle these

really challenging, complex problems that are very local and yet we have the benefit of not just our experience, but we can tap into the benefit of generations of experience.

The quote I like, I think, is Howard Buffett. He said 'Every farmer has forty seasons to learn and to experience and to get better.' But if you have a thousand farmers, you've got 40,000 years that you can start to build on. And if you think about that generationally or globally, the pace at which we can learn and apply that knowledge really accelerates.

So that's what gives me hope. And that's where the technology comes in because we've really have, you know, just in the last few decades, created collaborative tools to do that in a whole different way.

Bollier: Well, that's a perfect segue to your interest in open-source technology. You know, in preparation for this interview, I checked back with the book *Two Bits: The Cultural Significance of Free Software* [00:11:00] by Christopher Kelty. He notes how free software is, quote, 'a kind of collective, technical, experimental system.' It blends conventional practice with daring experimentation. It privileges creative, pragmatic solutions over proprietary business models, over entrenched political interest and even the law itself. So it seems that your practical, personal, localized approach to agriculture is really a perfect fit for what open source technology is all about.

Cox: Yeah, no, it really fit in and it was really recognizing…. I mean, I think one of the things that we've seen with the rise of the internet is like, I think, I think another one of these quotes was like, thank goodness Wikipedia works in practice because it doesn't work in theory, but that sort of shows the limitation of our theory of the way things should work and what's been remarkable about tapping into the tools that were created out of necessity to create the internet. They were [00:12:00] built on generations of other ways of sharing knowledge and exchange other than commercial transactions. It turns out people really like to share and to share their knowledge, and there are other ways that we create value and work with one another.

I feel like that's part of what we're tapping into, and particularly with agriculture, because it's so deep in terms of how we define ourselves, in terms of the food we share and how we talk about and define who we are as communities. And so I feel like that's very much what we're tapping into when we are talking about exchanging and communicating around the creation of shared tools and technologies and sharing knowledge and seeds. I mean, it's one step removed from sharing a seed to sharing a meal. A lot of the book is exploring that it isn't anti-competition, but it's recognizing that in growing ecosystems we have both collaboration and competition, [00:13:00] and it's really at different levels. And that's what the open-source software movement is recognizing: that these are complimentary forces that can improve the quality of enterprises, that can improve the quality of life, that can make it more joyful to be a human and to work and to find meaning in what you're doing.

And there's those other aspects of sharing and joy, and connection is actually a key driver, I think, in the success of a lot of the open-source communities; is that there's something that isn't fully being met with a straight transactional form of exchange. And I think that's really powerful, and, again, I think we're, as a global community from commercial entities and corporations to government, recognizing that there is this greater meaning and nuance. And I think that's what we're seeing in

terms of [00:14:00] the accountability efforts that we're seeing in the commercial space. That there's a desire for these other aspects of the way in which we work together.

Bollier: That's a wonderful overview of open-source software and its basic principles, but maybe we should get more specific. People are familiar with open-source software perhaps, but they might not be familiar with open-source hardware, let alone agricultural equipment as open-source hardware. Maybe you could go through some of the different open-source domains that your book talks about.

Cox: Yeah, and it's interesting. So I think we're using open-source in a fairly broad sense here. There are lots of open-source licenses, which are ability for others to use your work with attribution in order to build on it and with that intention. And I think that's really important as the foundation.

And so we're using open source as a shorthand for that intent. I feel like in some sense, open source is a reaction to a broken system around intellectual property [00:15:00] that in fact patents are meant to take something where ideas are non-rival. You can use the knowledge that I have without it affecting me directly, and that's not scarce, that is actually abundant. We can create abundant ideas.

The issue is then really about attribution and credit for those ideas, and I think that's where the open-source license is really focusing on, and I think in general is how do we create systems of exchange that credit and build on one another's effort and are really designed specifically around that, that that's valued and your community contribution is one of the key values that we all recognize. And so that's where, whether it's software or it's hardware, or whether it's seeds or it's artwork, these are all examples of the intention and creating systems by which we're creating works that are intended to be built upon. That's really the foundation from my [00:16:00] perspective and the ethics behind open-source tools and technologies.

Bollier: Let's talk about how that plays out for a particular farmer. What type of knowledge commons do farmers need or want to participate in? And how can it be useful for their farming?

Cox: Yeah. Well, and it's specifically important when it comes to hardware, because hardware is very expensive to prototype.

So to go from an idea to something that needs to go into a welding shop and be fabricated and tested in a field, there are many, many points of innovation along the way. And each of those failures or successes comes at a price. And so to the extent that we are able to share in the cost of that experimentation and then also value those who are pushing the boundaries and recognize their contributions, I think that's the foundation of it.

What we've recognized is that it's not just the end tool where there's innovation, but it's actually the [00:17:00] process by which it's manufactured. There are innovations in making something less expensive, in sourcing local adapting tools to what's locally available. There are also innovations in how existing tools are reused or repurposed, or the specific context in which that tool is substituting or working within its environment that the specific skills in which you use a tool, say, a particular type of cultivator that works with a cover crop at a very particular stage of growth. Or, the example I think I may mention in the book is a roller crimper is a prime example of a very simple tool that the

Rodale Institute did a lot of development on. It wasn't a new idea, it's actually generations old. There's indigenous practices of crimping crops into mulch in the field by rolling it at a very specific stage of the growth of the grain. They documented a specific tool to do that process [00:18:00] and, and then published the designs.

That sparked global versions of that same basic concept, but it required not just innovation in manufacturing, but also it required a certain amount of knowledge about the biology of the crop and how it was functioning in the soil.

And so that whole context is an incredibly rich package that really moved a whole approach to managing soils, managing crops, managing weed suppression and had these ripple effects that I think are still playing out.

Bollier: In your book, you mentioned a number of, you might say, cutting-edge, low cost, do-it-yourself technologies and scientific tools.

For example, you talk about drones that have cameras and can map fields or sensors that can monitor the weather, or infrared photos that can be taken of the soil to see the photosynthetic activity of plants. Let's talk about some of those and how they might seem to be technical and complex, but how they could be a [00:19:00] source of open-source development and use to farmers.

Cox: Yeah, absolutely. And I'll talk about a specific event that I go into in the book, but it was just a very powerful and really changed the course of my work. I was in the process of exploring agricultural techniques to reduce tillage and incorporate cover crops into field trials, and the results were really dramatic, and I was trying to express in a way that would be more easily communicated to a larger audience the growth and diversity of what I was seeing with hairy vetch in the field that we had no tilled.

I could tell that those patterns were really dramatic on the landscape, but again, they look really boring as a chart on a PowerPoint. It was just at the time that digital cameras were becoming very inexpensive, but multirotor or drones were not really on the scene yet.

You could get some expensive hobby type helicopters or model helicopters, [00:20:00] but I was looking at how could I get this aerial view to really express these patterns that we were seeing on the field that clearly showed in a dramatic way these different treatments and the differences that we were observing. And it was at that point as I was working within Farm Act, that they connected me with a group called Public Lab.

They had been doing a lot of [work], around the country and around the world, to adapt them and share the code and how you can modify these things that were now becoming ubiquitous and very low cost to be able to create much higher resolution imagery than you could get from an airplane or from satellites at that point and stitch those together to create these incredible visualizations where you could pick out, zoom in down to the leaf level. That was really game changing to see that the same approach that we were taking for open-source farm hardware was being applied to scientific

observation tools so that anyone at that point, anybody with $30 can go down to the grocery store with a station where you can get helium balloons filled up [00:21:00] and fill up a big balloon that mail order, attach your camera to it, and you could create these beautiful landscape images, maybe a decade before drones became ubiquitous, and a lot of those same tools and technologies became part of things that you could buy at the hardware store. But I think the key there was also that these were being created intentionally with tools to not only get the images, but process them and make meaning and create a community around interpreting them and to create a sense that this is something that is accessible.

And that the tools that we're creating through this DIY process are also empowering for communities and a reflection of who we are and who we want to be. It was really influential to talk to that group of citizen scientists and developers and their focus that, again, that technology is a reflection of our values, that a low-cost environmental sensor says something about who we want to have this knowledge.

If we have to rely on analyzing soil or [00:22:00] soil imagery only on lab equipment that's $60,000 or a multimillion dollar, or billion-dollar satellite programs, then there are power dynamics that then get into play in terms of how we make decisions about how we manage our communities and our local environments.

And so there was a really important ethical intervention, I think, in terms of how I started to think about the development of tools and technologies and accessibility and creating tools, again, that can help us tell better stories about ourselves and our environment.

Bollier: It seems that a lot of this builds on your experiences with the group Farm Hack. Could you tell us about the experiences of Farm Hack: how it developed, what it's all about, and how it proceeded to develop open-source technologies for agriculture?

Cox: It was actually very serendipitous. I had come to some of these same, multiple points of intervention, I guess, in my [00:23:00] career. My journey to Farm Hack started with fuel prices on the farm had really spiked where diesel was already getting over $5 a gallon, not surprisingly, after the Gulf War and so forth. Just a real sense of dependency and vulnerability in agriculture to the global supply chain.

And I had been introduced locally at that time to, I'd been in Argentina, I'd seen sunflower fields, I'd seen canola fields and oil fields that were being turned into biodiesel and there was a local movement and online communities connecting to how to scale down industrial processes to the farm level such that there could be energy independence. We saw at that point some early advocates of open-source making that technology open-source, and I met those folks and quickly became converted that this is the pace at which we could learn and be able to adapt these tools to be able to create [00:24:00] low-cost fuel for our own farm was dramatic.

We went in six months from this being an idea to being able to produce the vast majority of the fuel we were using on the farm, using that knowledge. At that point, I happened to connect with, you know, again, I think these ideas come in phases and culturally ripen. I intersected with a group of the

Nationally Young Farmers Coalition and Greenhorns, and folks at the M.I.T. Development Lab who had a very similar idea about how knowledge should be shared and jointly developed not only on the farm, but in partnership with the larger technical community, designers and engineers, as well as farmers working together to create solutions that are then shared widely. So they had started actually and coined the term 'farm hack,' and I brought some of these tools and technologies and communities that were waiting for that concept to essentially create the platform for beginning that knowledge exchange.

And so it was really an exploration and maturity of the [00:25:00] idea of what does it look like if we take the concept and we built it all on open-source software too. That was the other thing, because the community was already there, the public lab community was already there in public science.

And it was just saying, 'What happens if we take those same concepts that are maturing in science and technology and begin to apply it to our environment in agriculture?' Turn it from theory into practice on the ground. And so that was the foundation of the farm hack community, which then sprung up into these co-design sessions around the country to really begin to document the innovation that happens on farms every day and begin to share the skills both for documenting and local manufacturing of tools that suit a new kind of agriculture that will be responsive to local communities and fill in the niches that are being left and in demand in local economies, from the large scale industrial production systems that was leaving a lot of the [00:26:00] tools that are necessary behind. So very quickly there's a lot of innovation at a very short period of time and that continues to evolve. I mean, that concept continues to evolve.

Part of the exploration of the book was recognizing that we were rediscovering something that was not at all new. Farm Hack is a modern, like, even after we were doing it, we were like, 'Oh, wait a minute this is what the Grange was doing. Oh, wait a minute, this is what was happening in 1700s in France. Oh, wait a minute, this is what was happening even earlier in terms of open knowledge sharing around what works where, and sharing the tools. It is foundational, I think, very human and I think that's part of what we're seeing is we're tapping into something that not only multi-generational, but transcends the human experience, I guess, it's really deep.

Bollier: I mean, it seems to have so many manifestations these days in so-called cosmolocal production where you have open-source design and knowledge sharing and electronics and furniture and motor [00:27:00] vehicles and many other things. Is it fair to say that Farm Hack's ideas have really proliferated into so many realms that are just expanding, like data analytics and citizen science and new forms of open-source agriculture technology?

Cox: Yeah, I would say, I mean, I think we had a contribution to make, but I feel like we were a reflection of an idea whose time had come and it's really permeating across. It was, again, remarkably quick where it went from a very fringe idea to suddenly being the way a lot of ideas were being developed and brought into production.

And again, not just in agriculture, as you said, but it was part of this broader sharing and maker movement and development of ways of manufacturing and sharing designs that is really still maturing around the world.

Bollier: Let's talk about some of those variations in agriculture. I was fascinated to learn, for example, about the Million Acre Challenge in Chesapeake Bay, [00:28:00] Maryland, where you're trying to get this bio-regional knowledge exchange going.

It strikes me that there's a lot of other such knowledge exchange innovations out there. You talk about the idea of a digital coffee shop for farmers on a global scale, for example. Could you talk about these new forms of knowledge exchange?

Cox: I grew up in organic agriculture, but as my career evolved, I worked with a lot of conventional agriculture across different production systems and scales and geographies.

And what I recognize, there, is that often what gets focused on in the last generation was a competition of ideas, saying, 'This is the way.' And what I found, especially with a transition to focusing on soil health, is that most people, and farmers in particular, actually have a lot of the same questions, even if we don't agree on the answers.

And so the foundation of a knowledge exchange is really being able to first not share the answers, but first share the questions. And then what we [00:29:00] find is that by sharing the questions as we come up with answers, they are actually helping to answer our questions better. So organic producers say, Rodale, needs conventional production to make their case for organic and vice versa. And once we frame it and like we're in this together to come with solutions, then we really reframe the way in which tools are structured and the way we interact with each other and the pace at which we can create and accelerate innovation. That's what this idea of the knowledge commons or digital coffeeshop is saying. It's the idea that what our individual observations are much more powerful if we can compare them with others and what we're interested in are those that are both a little like us, but also a little different. So that we can see, well, what did they do differently? What was the same? And this is, you know, true about agriculture globally. In some sense it's all really part of the same system, but [00:30:00] it's also incredibly locally specific. It's a local economy, it's local relationships, it's local biome. It's, you know, your climate is unique, but there's somewhere else on earth that's really similar where they're testing those ideas. And often it isn't your neighbor that's most alike.

And so that's the idea, is being able to benchmark your results with others who have voluntarily shared their results in such a way that it's like sitting down at your local coffee shop and saying, 'What's working with you? What happened with, you know, that back 40 field last year, or what's going on now? I saw it from the road.'

It's being able to prompt that kind of conversation, and you can certainly do that locally and it's powerful that way. But how do we tap into these tools to enable us to both compare and benchmark our results across the board and then start the conversation and saying 'What's similar, what's different? How do I put it into context? [00:31:00] What's the scale of your operation? What is the thing that was different?' And then begin to create a dialogue across some of those historic boundaries, both geographic, cultural and across production systems.

Bollier: I'm curious how you would situate your vision of regenerative localized agriculture through technology to, let's just say, the Wendell Berry vision. He, of course, is the revered poet, essayist and

family farmer in Kentucky. He shares your vision of localized agriculture and being personally engaged with the land in a, you know, firsthand way and knowledge sharing. But, of course, Wendell Barry is famous for disdaining computers and technology. How do you reconcile your vision with his, or is he simply an outlier?

Cox: Oh no, no, no. I think it, and I quote Wendell Barry in terms of the debate with Earl Butts and the Department of Agriculture and it was about get bigger or get out, and their debate was…one is about production, the other is about culture. And I think that's still very true. It's like where do [00:32:00] those arguments connect?

And I'll say that, you know, the farm I grew up on was very much about the culture and my parents' reasons for being in farming and working with draft animals and the forestry work. There is a beauty that I think a lot in agriculture aspire to in terms of their own operations or what we think of when we say we really would love to go back to the farm, the family farm.

There is something that's important there and to be valued. And I will say that the work on technology for sharing and exchanging ideas, I don't see at odds with that. I think there's a lot of the ethic in terms of the community functions that we often long for at rural communities. And, in fact, I think the imperative, given the destruction that we've all collectively, you know, created in the environment to be able to more rapidly share what works and create ways in which we don't destroy that community, but actually use the technology to deepen those [00:33:00] connections with each other and to understand the environment and create new rituals in terms of how we understand our role within that.

And be able to communicate, not just in the rural communities, but build bridges between rural and urban communities that are supporting the production. So I feel like that's the other sort of big piece, really using tools to create deeper connections and recognizing that agriculture isn't just about the farmer and that experience. It's really about how we all engage in managing our environment together and creating a role for people in the cities in the urban fringe and how they engage in agriculture in some way, both with those who dedicate their full lives to it and those who just engage in some way in agriculture, on their windowsill, or in their backyard, and can experience the role of improving the environment.

But the final thing is if we were able to create essentially the rituals and [00:34:00] community support and embody our understanding of stewardship in other ways, in storytelling and in community functions, we could do away with a lot of these tools and technologies.

It's really a stopgap. It's sort of a bridge in terms of cultural understanding of how these systems work. And so I think that's the goal is not to have everybody on screens out in the world being told what to do by the computer to improve their soil, but to use that as a way to build individual understanding and to pass that knowledge onto the next generation.

Bollier: Do you see any dangers in the digital technologies in agriculture? I mean, open-source is certainly not proprietary and therefore that controlling, on the other hand, it could be a

homogenizing force. Could it be that networking technologies will level things out and maybe start to flatten out or eliminate the local peculiarities of a farming culture.

Cox: Oh yeah, without a doubt. Well, and some of that, you could say, is a [00:35:00] benefit in reducing the inequity in technology and agriculture and providing greater access. But even in that, absolutely a fraught area that requires a great deal of attention. And that's a huge focus of the work that we're doing within current efforts with Open Team or OpenTech Ecosystem for Agricultural Management.

It's a required condition for success to create tools that work for, you know, this is sort of a big statement. But in order to be successful in transforming agriculture, it means not just transforming big agriculture, it means transforming agriculture and providing the best possible knowledge for everyone who's engaged in managing their environment.

That means all languages, cultures, geographies, so you don't get there if you create tools that are inaccessible and people are not going to be trusted or to be or adopted. And the way in which you build trust is by co-creating them and having them [be] a product of the communities not [00:36:00] imposed upon communities.

And so that's a really important pitfall to be avoided, and it requires different pathways of development and different structures and funding mechanisms to make sure that that actually happens.

Bollier: How do you see big corporate agriculture fitting into this story? Because it obviously has less interest in small scale agriculture in the culture of a farm and ecosystems and so forth.

They could be free riders on a lot of the knowledge and systems that are being developed. How do you see them playing nicely with a system as opposed to co-opting it or appropriating it?

Cox: It's really complex and that's not just a cop out to not answer it. Big Agriculture means a lot of things depending on whether it's the buyers and the food companies, or the agrichemical manufacturers, or the landowners and large-scale producers that are supplying those systems.

There are very diverse [00:37:00] incentives across the board. And I've seen in some cases where the limits that we're already seeing actually because of the limits of conventional agriculture and degradation of soil, that the lower cost way to move forward even in the conventional system is to begin to regenerate the soil.

That doesn't address a lot of the rest of these social issues. However, we're also seeing an alignment in terms of sourcing and what's being demanded across the board for the social goods that are being produced by agriculture that are forcing larger scale agriculture producers to make very large commitments and with these tools and traceability that allow for accountability in a way that hasn't been possible in the past.

We certainly worry about greenwashing and free riding. But part of what's happening with the tools and technologies and ability to observe and have these tools in the field allows [00:38:00] for attribution for ideas. It allows for the providence that the, you know… to be able to validate claims that are made about products, not only about the environmental improvement, but the social conditions in which they're produced, the scale of the producers that are producing them, the biodiversity that's being created. All of those things…we're not there yet.

I'm not trying to paint a really rosy picture, but I also feel like the toolkit for holding…not only holding companies accountable, but also the demand for products that have those attributes is clearly changing not only the rhetoric, but the actual demand and some of the practices. So again, I'm cautiously optimistic that there is a path forward. There certainly is a danger for co-opting and using tools. If they're co-opting and using them to create a greater public good along the way, then we are moving in a [00:39:00] directionally, I guess the term is directionally correct. We're making progress. So it requires careful attention and diligence, for sure.

Bollier: Well, the big tech experience has resulted in the coopting of some aspects of open-source software. Maybe that's a cautionary tale in that we've seen how big tech comp companies have dominated some of those systems despite their being opensource.

Cox: A hundred percent. And we're certainly seeing this with access to land. And even if it's being biologically regenerated, creating equity and access and participation in these system is going to continue to be an issue. This creating these walled gardens or taking open-source tools and making them less accessible, or putting some proprietary label, black boxing them and so forth.

So it requires new governance institutions to oversee that and to steward those values. And I think we had an early prototype of some of those institutions with the launch of the internet. We've seen the erosion [00:40:00] of some of that as well. So I think we can learn from some of those lessons, and it's something that we have to constantly reinvent…these non-nation state governance entities that can oversee these commons that aren't geographically bound.

Bollier: Let me ask you another very difficult question, which I wonder about, which is: Technology historically has a mythos of humankind mastering and controlling nature as opposed to working with it, being synergistic with it. And obviously your vision is of the latter. But how can the technology be used in partnership with nature and with respect for it, as opposed to 'we're going to control nature and eek out as much as we can from it' in the classic paradigm of mastery of nature?

Cox: Yeah. Well, it's interesting in that framing because we are certainly, I mean, that's sort of the framing of the Anthropocene, which is like, we actually are large players; we are affecting the biosphere with our actions.

So, to some extent, we are a governance. [00:41:00] I think I go into the book a bit about the first land-based economist, the physiocrats, which you break it down, is governance of nature, physio-crat, and that governance I think is a really important piece because governance requires an interplay. And I feel like that's a fairly apt approach where it's not one or the other. We're both acting upon and working within nature, and we're part of it. And so I feel like governing in an

ecosystem is trying to interject and influence in a positive direction. Again, moving things in a way that generally produces more abundance over time, more diversity, more resilience. What we've seen, again, when we go down the other path, as we go through extraction, we create less resilience. We create systems that require more input over time. And as we reach some of those limits, this alternative solution becomes self-evident.

Bollier: We're seeing the assertion of nature as a living force, an [00:42:00] actor in its own right. This is forcing humans to reckon with its full agency as opposed to treating it just as a dead resource.

Cox: Very much so. And in fact, I mean this is what we're also seeing by many governments around the world and in pockets within the United States is the concept of nature having agency within our legal discourse, within our structures, this 'rights of nature' concept feels so radical and then once you dive into it a little bit it seems totally common sense.

It's that we have this construct of companies, which are lots of people together, that have agency to represent themselves within our public discourse. Why not the function of the rivers or the salt marsh that supports the biodiversity that creates our seafood that we're depending on? Why do we now have ways in which those systems that we depend on have ability to communicate and [00:43:00] represent themselves within our discourse and have rights at the table? They're creating a huge amount of economic output that we then depend on. And in fact, if we don't give them, I think that's what we're seeing, is that by not giving those entities access to those same rights, we are seeing negative consequences and we're calling it externalities and so forth, but they're real and we all experience it.

It's a complex concept, and it's very intuitive on the other hand. But it's something that's actually, it's not just theory, it's in practice. In Ecuador, they're working with the New York Stock Exchange to create these intrinsic value companies that represent that entity on the stock exchange. We're seeing the SEC requiring climate accounting across the board.

So there are little pockets of how this is actually reflecting in very conventional legal and financial institutions and structures. I think it's a really fascinating time. But if we can make the [00:44:00] observation, use the tools that we've created and make them ubiquitous and low cost and accurate, then essentially what we're able to do, if we can't do it culturally, we're actually doing it digitally to create this silicon nervous system that talks to us, that gives agency and voice, this data-driven voice of value that nature is providing to us.

So again, we can transcend that, but it's also speaking very clearly, we can see change over time, not only in satellite imagery, but if we measure soil change or water quality change or biodiversity, population numbers, insects, you know, populations. All of those things are telling a story about what's happening and how we affect it positively or negatively, and that's what gives that voice to nature through these tools and technologies, it changes how we can create our relationships with the environment.

Bollier: You conclude your book with a kind of summary manifesto called 'An Agriculturalist Hippocratic Oath of [00:45:00] Care'. Could you tell me your thinking behind preparing this and what you hope it will help define or promote?

Cox: Yeah. Thanks so much. It just struck me at one point in talking with some friends who are doctors about the Hippocratic oath and really thinking about the ethics of a profession around caring for other people and seeing that there are other professions that also have similar oaths around the professional responsibility, around the knowledge that they have.

It prompted me to read a more recent version of the Hippocratic oath for the medical profession. And then beginning to ask, 'Well, given that responsibility, when it comes to those in the agricultural profession, we are caring for something really important also, why not have a similar oath in terms of our care for the environment and for the soils and for the communities that depend on what we're producing?'

And so that oath is an adaptation [00:46:00] based on the medical Hippocratic oath and the duty is not only, it's fascinating. It's not only about your patient, but it's also about sharing the knowledge that you accumulate with each other and passing it on to the next generation, and that there's cultural importance and gravity to that that I think is also relevant to provide to those who are engaging in land stewardship.

I'll note that since we put that agricultural Hippocratic Oath within the open team community, we've been expanding that into other aspects of agriculture and those who are caring for agricultural data, and communities and food sovereignty, and things like that. This concept that, as we recognize our role in stewarding a regenerative economy, there are culturally significant aspects to what we're doing that should be recognized and celebrated. And creating social contracts with one another is an important part of moving that forward. [00:47:00]

Bollier: Well, Dorn, I want to thank you for sharing your thoughts about your book, *The Great Regeneration*, and really just for offering a hopeful vision for regenerative open-source tech future in agriculture.

Cox: Well, thank you so much, David. It's been a real pleasure.