



TRANSCRIPT

Environmental Insights Episode #6, 2024

Guest: Charles Taylor

Record Date: June 28, 2024

Posting Date: July 8, 2024

LINK to podcast: <https://on.soundcloud.com/R13SP8xdg5U67RRa8>

Charles Taylor: What I've had a little bit of success at doing is creating new data sets or trying to be between the science and the economics to find new data to put at these questions. Keeping in between those worlds has been, I think, a way for me to get at questions that maybe others haven't gotten at before.

Rob Stavins: Welcome to [Environmental Insights](#), a podcast from the [Harvard Environmental Economics Program](#). I'm your host, [Rob Stavins](#), a professor here at the [Harvard Kennedy School](#) and director of the program. I've had the pleasure, the great pleasure, of including in these podcast conversations over the past five years a truly significant number of outstanding economists who have carried out important work relevant for environmental energy and natural resource policy, including sometimes by serving in important government positions.

And that inevitably brings with it the reality that many of the people I've spoken with have been senior leaders in the profession, with the emphasis on the word senior. And so like me, they have an abundance of gray hair, if hair at all. But today, I am delighted to break the mold with someone who is, in my view, a rising star in the world of environmental and resource economics. I'm referring to my colleague [Charles Taylor](#), who's an assistant professor of public policy at the [Harvard Kennedy School](#). Welcome, Charles.

Charles Taylor: Thanks, Rob. It's great to be here.

Rob Stavins: So, before we talk about your research and your current thinking about environmental and resource policy, our listeners are always interested to hear about your personal background. So let's go back to how you came to be where you are. Where did you grow up?

Charles Taylor: I'm from Virginia, not too far from DC.

Rob Stavins: So, did that mean both primary and high school there?

Charles Taylor: Yeah, so had primary and high school there and then went to undergrad at University of Virginia, which is about an hour or two outside of DC.

Rob Stavins: But you were a resident of the University of Virginia or were you able to commute from home?

Charles Taylor: I was in Charlottesville.

Rob Stavins: You were. And so your degree in 2007, I believe is a combination. Is this right? Of a bachelor's degree in economics and a bachelor's degree in political and social thought?

Charles Taylor: Yeah, exactly. It was a double major, and the economics major was great. I think pretty standard as it comes to economics programs. But the political and social thought was this really wonderful program at University of Virginia that really challenged what, I guess at that time I thought perhaps I might be a future political philosopher or something and would really think about the ideas behind a lot of the policy questions we have and systems and government and economic systems. So, that's some nice theoretical grounding I got as an undergrad.

Rob Stavins: And does that continue to influence you or did it subsequently influence you?

Charles Taylor: I don't know. I mean, it certainly probably influences how I view the world. I think the general, this kind of goes into I'm a somewhat atypical PhD and economist of what my journey was into it, but it definitely took me down a trajectory before starting my PhD, which exposed me to a lot of things, which certainly informed my research now.

Rob Stavins: So, that's interesting, because something that you and I share is that after graduating from college we both did a variety of things before going to graduate school to study for a PhD degree. In my case, it included serving in the Peace Corps in West Africa, working as a researcher at UC Berkeley, and then working at the Environmental Defense Fund. So, can you tell me about your professional path between college and graduate school? I mark off at least three stops along the way, but maybe there are more.

Charles Taylor: Yeah, certainly. It was a meandering, fun journey. I graduated and for lack of really knowing what else to do and wanting pretty broad exposure, I started as a management consultant at McKinsey. And this was kind of the heyday of the economy was strong and right before the 2008 crash. And so I got to go work abroad in Qatar and Brazil and Europe and get a lot of exposure to also these big climate change and land-based initiatives that governments and the private sector were doing. And I got really excited by that and also very quickly learned I didn't want to be a consultant.

I felt that I wanted to get more either skin in the game at that time or more in depth into the issues, and that prompted my journey into more of the entrepreneurial world where I got connected with a guy who was a former banker and he shared some passions I had about land, which I'll talk about I'm sure on this podcast quite a bit, and how do we restore land? How do we restore ecosystems to meet all the challenges we're facing, from water to food security to pollution to climate change, and how do we do that at scale? And the kind of idea there was start a company that tried to kind of do next generation land management. So, how do we restore degraded lands? How do we farm in a sustainable way? How do we deal with invasive species and that type of thing? I did that for a while.

Rob Stavins: I thought from McKinsey you went to the Bill and Melinda Gates Foundation. Is that not right?

Charles Taylor: Yes. I jumped over that. So, I worked for the Gates Foundation, was one of my clients at McKinsey, and I was working on their-

Rob Stavins: I see.

Charles Taylor: ... agricultural development strategy for Africa. So, it was as many people are interested in, and a very important topic is how do you spur agricultural productivity in Africa, in sub-Saharan Africa where it's been lower than a lot of the world and hasn't quite had the green revolution that we've seen elsewhere.

A lot of that, that was part of also then kind of what got me excited to think about what one could do from a private sector standpoint, seeing both what large grant making organizations, like the Gates Foundation who's a major donor in this space, how they're trying to pretty much facilitate markets and they're trying to overcome externalities and play the role that the public sector often does or enable those things.

And that experience there in particular, a lot of time on the ground in East Africa and some other work I've been doing got me, like... Land and agriculture is important everywhere, including in the US and Europe, but it's just particularly important in the developing world where a lot more people are dependent on agriculture from a subsistence standpoint, as well as a lot of the environmental challenges, both from climate change as well as soil degradation, are a lot more pressing there just because of their geography within where climate effects are happening.

Rob Stavins: So, at McKinsey and Company, one of your clients was the Gates Foundation, and then you left McKinsey and you actually worked for the Gates Foundation, or am I confused?

Charles Taylor: Yeah, it was somewhere in between. I had developed a relationship there and then after I left McKinsey, I stayed on to finish the project sort of as an independent, and then once that was finished, I moved on.

Rob Stavins: So, I've known a lot of people who worked at McKinsey and then wound up leaving McKinsey and joining the client. So, it's not a unique path. It's an interesting one and I guess a valuable one that you took. So now from there, you were a co-founder of [Earth Partners](#) and director of business development. Can you tell us what [Earth Partners](#) is, how it is that you went about founding this? Elaborate on that.

Charles Taylor: Sure. So, I guess as a backdrop, there's two types of people, at least this was the read in my 23-, 24-year-old self. The people who would go through consulting, realized they wanted to be a consultant, and then the people who used it to learn a lot, particularly across industry and business and place and figure out what they want to do and then use that as a launching pad. And that was where, as some of the work I was doing, I was working on sovereign wealth real estate funds in the Middle East, then sugar cane and irrigation optimization in Brazil, and then the Gates Foundation work about agricultural productivity in Africa, and all of these things I was kind of getting this vision of, huh, a lot of the challenges we're facing as society directly or relate to land management.

And looking around, I didn't really see any companies or organizations taking that head on of we can incentivize land restoration, which can mean lots of different things. It's a rather imprecise term. It can say we're going to build soil carbon and take carbon out of the atmosphere. We're going to improve water retention in soils. We're going to reduce wildfire risk by managing invasive or pest-killed species. We're going to deal with salt salination and try to get all these co-benefits, things like improved habitat. Can we make a business model out of that so we could actually do that at scale and try to get all these co-benefits?

And that was the philosophy, and I had no idea how to do it, but I teamed up with the right person. And he had been a banker, David Tepper, for a while. He was in London and he kind of said, here's this young guy who wants to do all the work, and he was looking for a career change. We said, "Well, let's give it a shot." And then there was two partner companies, which gave us a lot of on the, you know, what does a banker and what does a consultant know about the land? But we partnered, we brought together Applied Ecological Services, which was kind a grassland and management company who had a really large native seed nursery in Wisconsin, and they were prominent throughout the Midwest, as well as a forestry company in British Columbia called Brinkman Associates.

And the two founders of those companies were also really interested in... They had built these successful businesses, but they said, let's figure out how to do what we do at scale and not just on a contracting basis. So that was the idea behind the company. And then the company over the course of seven, eight years while I was there took me all over the place and through all sorts of

business models as we were trying to figure out how to have these nature plus ecologically sustainable land management business models.

Rob Stavins: And does the company still exist?

Charles Taylor: It does. David Tepper, he's CEO. The company is called The Earth Partners LP. Right now a lot of the work that it's doing is innovations in the wetland mitigation banking space.

Rob Stavins: I see.

Charles Taylor: And also, then trying to manage lands at scale and improve habitat and environmental outcomes at the same time.

Rob Stavins: Oh, that's interesting. So you went from there, is that when you went to graduate school?

Charles Taylor: Yes. So, I was there and then I think I'd been doing that for, gosh, I don't know, maybe seven or eight years and I loved it. It was super entrepreneurial. We had a lot of projects, but the team remained small. And I'd fly somewhere and I'd go move to Texas to try to get a ranch land and grassland business model going. I moved to Brazil for a while to try to get some projects going there. So, I kind of had this very interesting-

Rob Stavins: Interesting.

Charles Taylor: ... dynamic experience. But then I think I kind of started having this realization where we had far from many home runs, but we had a few moderate successes and a lot of failures in the journey. And a lot of it was just we were trying to do where the markets hadn't gotten yet, we were trying to fill some role where there was some public policy market failure.

I mean, I was almost thinking back to my Econ 101 days from undergraduates where it's like isn't, why can't we make markets work where we're trying to build soil carbon or have these win-wins or manage agriculture in a way that can have co-benefits and not just create more downstream water pollution? And it came back to all those things that economists know very well of we just didn't have the right kind of enabling infrastructure and the right institutions in place.

So, that got me really both frustrated because I kind of saw the limit of what you could do with capital. We had great small-scale investors who wanted to do good things, but you still had to get their money back in a few years and that limits the scope of what you can do if you really want transformational change. So, that made me say, okay, what if I went back to the research side and found some way I could contribute to these problems on the other side while keeping one foot or at least half my brain in this world of how this more on the ground world works?

Rob Stavins: So, that was your motivation for going to Columbia, which now it sounds like a very direct path for the PhD in sustainable development, which is a remarkable program at Columbia where I believe your field, your focus was environmental economics.

Charles Taylor: Yes, exactly. And this is maybe where I'm more atypical is that I hadn't actually thought serious about a PhD or grad school during undergrad or really during this time. And then it popped into my head and I got really excited, but I didn't really know all that many people. I didn't really know any economists. I knew some other friends of mine had done PhDs in other fields, and kind of trying to find something that I had been doing a lot of science on the ground and working with landowners and working with local governments and scientists and loved that part of the environment and then also saw these economic tools I wanted.

And Columbia has this wonderful program that tries to bridge some of the science and economics. And I'd also lived in New York before, so I had personal reasons I would be happy to move to New York again and give it a shot. And they were very kind. I mean, I don't know if they took a chance, but they let me in, given that I didn't have some of the more, I'd say conventional math background for example, that a lot of the PhD candidates did.

Rob Stavins: But you made up for it. So, who was on your dissertation committee?

Charles Taylor: So, it was Geoffrey Heal, phenomenal environmental economist who retired recently, Doug Almond, and Wolfram Schlenker.

Rob Stavins: So, people I know. Geoff has been on this podcast and Wolfram will be shortly, and I should add in a plug for our institution that Wolfram Schlenker is a wonderful agricultural economist, an environmental economist. I guess he's joining the Harvard Kennedy School faculty.

Charles Taylor: I think that's right.

Rob Stavins: I mean, he's already been around the building. So, what was your first position out of graduate school?

Charles Taylor: So, I did a postdoc at UC Berkeley in their Ag Resources, ARE, Department, and then came to the Kennedy School.

Rob Stavins: And my recollection is that you did what is frequently the case now, particularly with the best PhD students on the market, is that they get an offer for an assistant professorship to start immediately and then they say, "I'd like to accept that, but with a delay of one to two years to do the following postdoctoral fellowship," which might be at some other institution. And I think that was the case with you, wasn't it?

Charles Taylor: Yeah, and it seems like it's definitely the norm now, being on a search committee recently here at Harvard. And it was great for me. I had a strong network at Columbia of people I was writing papers with, and I've continued that, but then starting at Berkeley, which just has a phenomenal group. I've started a few projects with the incredible group of environmental economists here, and I can kind of bring that network to Harvard. So, it certainly helped me and gives you a little more time. And living in Berkeley for a year was also an added plus of a year in paradise as far as lifestyle goes.

Rob Stavins: Absolutely. Yes, I completely agree with that. So, let's turn to your scholarly work in the world of environmental and natural resource economics. Your published work and your working papers are actually very diverse. If one wanted to identify a common theme or themes, would the phrase be land use or is there a different way to characterize the common themes of your work?

Charles Taylor: Yeah, that's a good question. I was asking myself that before this podcast where... I definitely think there's topically a theme of land use and it's kind of like the give or take of you think that a lot of my work tries to say, how do humans affect the land? So, humans have touched nearly every acre of non-barren land on earth. We've transformed it. We farm it for our food. We take its water. We shape its rivers for reservoirs, for irrigation. We use the wood for forests. We build on it for housing. We use it. We get our energy out of it increasingly for renewable energy. We need a lot of it for siting wind and solar. And then climate change interacts with all this. So, there's all these questions I am really curious about there about just quantifying that and using some of the empirical tools we have there.

But then also, the feedback goes the other way. What we do on the land has a big effect on human welfare as well. The feedback loop goes the other way, where we build and where we live shapes risks. So flooding, wildfires are two very prominent examples of where development has happened and has increased risk to those and also affects, there are these trade-offs to land use regulation in terms of housing prices, urbanization, where you can build and where you can't.

And all these questions just, I think that area really had been kind of similar to the work I'd been doing before my PhD. And as I was doing my PhD, I just was just overflowing with these questions that like, huh, maybe I can try to put some data to this and put a model to this and try to answer it.

Rob Stavins: So, you have three wonderful children, the youngest a relatively recent arrival. And I won't ask you which is your favorite. That would be an absurd question, which couldn't yield an answer. But I do want to ask you, what's the one research product, whether it's published or not, that you're most proud of?

Charles Taylor: I have a paper on wetland regulation, which actually I think Rob might be the person who beat me to this a few decades ago in writing about wetlands, the economics of wetlands in the AER maybe a few decades ago. But that paper

largely married some of the work that I had done previously in wetland mitigation banking and on the land before and understanding, and then also a really prescient policy question.

The Supreme Court was destined to come up and adjudicate what constitutes waters of the United States. And a very kind of quick, high level overview of this, under the Clean Water Act, it determines what you can build on and what you can't. If you cross a stream or a wetland, you need to get a permit under the Clean Water Act. And what determines whether that water is regulated or not is this definition of what is a federal water WOTUS. And there was, that's gone back and forth over the administration for decades about administrative rule changes, about how that's going to be defined by the EPA and the Army Corps of Engineers.

And there was a big rule change under the Trump administration and it was contentious and it often goes back to the Supreme Court, and one of the questions that they used to justify it was like there's no good quantified estimates of the benefits of wetlands to society. It's partially true. There's been some good work on it, but it's really hard to get a good empirical estimate on this for all the reasons us economists know, just like where wetlands get developed is endogenous, meaning where development happens will often be in flood plains, might be wetter in general. And then also what gets developed over time gets more real estate exposure, more assets exposed, so that when flooding happens, there's more damage.

So, you might see this spurious relationship between where wetlands are lost and more flood damages, for example, to think of one of the benefits of wetlands. And that paper was just trying to find an empirical way to uncover that and give an estimate of the value of wetlands that then could be used by the EPA in measuring the cost and benefits of these types of regulations, which are super important and cover almost all land use decisions and where you're going to build in the US.

Rob Stavins:

Did that work then result in your being contacted either to be an expert witness in litigation, to testify before a congressional committee, to make a presentation to the EPA?

Charles Taylor:

Indirectly, yeah. So I should also note this is with the co-author Hannah Druckenmiller at Caltech. And we didn't directly talk to Congress, but we talked to a lot of the parties who were either filing the lawsuits or the kind of on the ground association of wetland managers who are trying to incorporate some of this guidance into their work.

So, I think in the next round, the spoiler alert is the Supreme Court did rule on this recently and sack it, and came out in favor of an earlier rule, which isn't all that different than the Trump rule, that liberalized development on wetlands, but that this estimate could be used and refined going forward in future cost-

benefits analysis, particularly with anything that the government's doing or trying to refine their rules.

Rob Stavins: You mentioned your co-author, Hannah Druckenmiller. Was she also a student in your program?

Charles Taylor: No, she was at Berkeley ARE where I was a postdoc.

Rob Stavins: I see.

Charles Taylor: And this is a funny story.

Rob Stavins: Oh, oh, oh.

Charles Taylor: She came to Columbia for a semester, I think because of her partner was residency or something, and she hung out at Columbia because there's kind of, Wolfram, my advisor, went to ARE and was friends with a lot of the people there. So, she kind of got adopted there and we got talking about this idea of could we put a number on the value of wetlands from a flood standpoint. And we got really excited and she has an incredible set of skillsets that I learned a lot from in the process, and who also was about to have her first kid. And I was around also having my first kid. So, I think we were in a similar place in life where we were, remarkable that we got this paper off-

Rob Stavins: It is remarkable.

Charles Taylor: But we could work together. We understood where we were going.

Rob Stavins: You said she's at Caltech now?

Charles Taylor: Yes.

Rob Stavins: So, she was at [Resources for the Future](#) as a fellow for a while. I was not fully aware of the fact that she had left, but I guess she has.

Charles Taylor: She started up her, she finished her first year I think at Caltech.

Rob Stavins: I see. Well, that's great. So, your work, as I said, is diverse, but it's also been quite prolific and some of our younger listeners can benefit, I think, if you can say something about how you've gone about identifying a research topic and launching a research project, whether in general how you do that or by way of a single example. I guess you just mentioned one with Hannah, how the gestation of that took place. Is there another one that you could describe?

Charles Taylor: I think I have a topical interest, but I maybe also have a methodological... I'm fairly agnostic about the question. So, right now I'm writing on migration and climate, which doesn't have much direct relationship to land. And I think the

way I try to do it is where can I overcome the spotlight effect of where people are focusing because of where they have data sets.

Rob Stavins:

Yes, indeed.

Charles Taylor:

They're able to create a credible identification strategy, and there's just so many big questions, especially in the environmental space that fall far outside of that. So, it's a slightly riskier approach because you might just come up with nothing but what I've had a little bit of success at doing is creating new data sets or trying to be between the science and the economics to find new data to put at these questions.

So for example, there's a big question on what's the actual cost of nutrient pollution from agriculture? And it's really hard to get that because we don't have good county level panel data on algal blooms, which is one of the ways that this manifests and can create an economic and social cost. And well, let's try to extract that from satellite data. Or how do we really understand the CO₂ fertilization effect in the real world at a large scale? Well, there's a new satellite launch that has CO₂, has a column to measure CO₂.

So, keeping in between those worlds has been I think a way for me to get at questions that maybe others haven't gotten at before. But also I'd say lots of economists have that skill, but it's kind of a nice complementary skill that then I can bring when I collaborate with other folks.

Rob Stavins:

Well, I find it interesting and I think it's very important. I find it interesting partly because when I was doing my PhD, which I got in 1988, so it's ancient history now, but I was working, as you noted, on the depletion of forested wetlands. And of course there was no Landsat or any other kind of satellite imagery at the time. There were aerial photographs, and the US Army Corps of Engineers down in Arkansas, Louisiana and Mississippi had them.

So, we went down there and we photocopied hundreds, probably thousands of aerial photographs and then got out a little device called a planimeter in order to actually measure the areas, and that's how we came up with the acres at particular locations that were being converted at particular points in time.

The reason I said, in referring to what you just said that I think is so important, is I've been disappointed that so much of the focus now that I see, and it's not just at Harvard. It's at other institutions where people are doing PhDs in economics, including in environmental resource economics, that the focus is where can I get a data set. Now given this data set, is there some question with it, which I can have an identification strategy so that I can say something, as opposed to starting out with what's the policy question and then going from there, which as you noted might mean collecting new data.

Charles Taylor:

And I mean to some extent one of the nice things, and maybe this is the advice to grad students, is what you described, Rob, is that was the good old days when you could actually find something in the archive that no one else had digitized and do this incredible amount of work. I mean, especially in things related to the environment and land, there's just so much of that good stuff out there. But on the other side, if you have a policy question, and the IRA, the Inflation Reduction Act, has opened all sorts of interesting ones, like our rollout to trying to get to net-zero has.

There's just so many questions, and then there's just such an overwhelming amount of data as well, and just minimal costs now. There's a learning cost, but on my desktop computer through Google Earth Engine or other services, I can just go through Landsat images over the last three decades and create temporal and spatial statistics of all sorts of complex calculations that try to approximate some variable that I want that would've taken 10 supercomputers to get those images before. So, it's remarkable what you can do when you kind of have a targeted question because there's just so much out there and the barriers to entry have gone down.

Rob Stavins:

Just as importantly as knowing how to start up a research initiative is knowing when to abandon a research project, particularly when you've invested a significant amount of time in it. In other words, how do you avoid getting trapped in a sunk cost fallacy? Are there points at which you have been working on something, whether it was very preliminary or you had actually put in quite a bit of time and then you decided, I don't think I'm going to pursue this further. And was that a difficult choice if you did make that choice?

Charles Taylor:

Yeah, I mean that is certainly the nature of the game and it is hard. So, there was an example where maybe I'll put this out, if there's any curious reader who can figure out how to do this in a way that I can, I would be delighted. But we're always looking for exogenous variation, and what's really cool about a lot of land and environmental policy is that it's governed by the Army Corps of Engineers in the US, and there are these districts which have boundaries, which I'm sure Rob knows about, which often cut through the middle of counties. There's a lot that goes into them, and there's heterogeneity in how different policies are implemented across these districts because there's quite decentralized governance of them. They're run by these colonels who are appointed, who have a lot of autonomy.

So, I had this seemingly brilliant idea that I could use this really random variation to try to get at some differences and all the things that the Army Corps did and trying to look across this spatial boundary. It never kind of came up. So, I spent a lot of time working on that, but eventually thought that I'd put that aside.

I found with a lot of my research questions, I'll come back to them. I've learned something new, six months later, a year, I learned about some new policy or some new policy question or some new data and say like, wait, what if that's the actual important question? Or what if I looked at it tweaked that way now that

I've learned this new thing? And that second order, let it rest for a little bit, but realize you don't have to let it go forever. I have come back to a number of projects that have been ultimately proved to go somewhere.

Rob Stavins: So, that can be not only very helpful, but I think actually inspiring for younger students, both people who are about to go to graduate school, are in graduate school, or like yourself, are assistant professors, or for that matter, postdoctoral fellows. There's some wonderful lessons in all of that. So, Charles, thank you very much for having taken time to join us today.

Charles Taylor: It was my pleasure. Thank you for having me, Rob.

Rob Stavins: So, my guest today has been [Charles Taylor](#), an assistant professor of public policy at the [Harvard Kennedy School](#). Please join us again for the next episode of [Environmental Insights: Conversations on Policy and Practice](#) from the [Harvard Environmental Economics Program](#). I'm your host, [Rob Stavins](#). Thanks for listening.

Announcer: [Environmental Insights](#) is a production of the [Harvard Environmental Economics Program](#). For more information on our research, events, and programming, visit our website, heep.hks.harvard.edu.