

WE ARE ETH – Episode 27

With Lian Pin Koh, biologist and conservation drone pioneer

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Lian Pin Koh: We joked about how maybe we can just stick a compact camera underneath one of these glider planes and fly them over the forest in Sumatra, Indonesia. And maybe we can use that to detect orangutan nests. That would enable us to count them and study their populations. So that was the genesis or the beginning of the idea of conservation drones.

[00:00:28] **Susan Kish:** In this episode, I'm talking with Lian Pin Koh, a biologist and conservation drone pioneer who's a full professor at the National University of Singapore, as well as director of the Center for Nature Based Climate Solutions and tropical marine science. Lian Pin is also a member of the parliament in Singapore, and a former researcher and postdoc at ETH Zurich. This is the We Are ETH podcast, and I'm Susan Kish, your host.

Lian Pin, thank you for joining us from Singapore. You're our first guest from the Far East, and we're delighted to have you here today.

[00:01:06] **Lian Pin Koh:** Hi, Susan. Thanks for having me. I'm very happy to be here.

[00:01:10] **Susan Kish:** Fantastic. So you are a scientist and now a Member of Parliament. Are those similar? Are those, different? Where do you have more impact?

[00:01:20] **Lian Pin Koh:** Oh, those are tough questions.

[00:01:21] **Susan Kish:** Haha.

[00:01:23] **Lian Pin Koh:** I have actually just completed my term as a nominated member of parliament. It ended in July, after having been in parliament for two and a half years. It's a special scheme here in Singapore whereby we have nine seats reserved for nominated MPs, as opposed to elected MPs.

[00:01:47] **Susan Kish:** Huh.

[00:01:48] **Lian Pin Koh:** So it's to help the Parliament have adequate representation from different parties. Stakeholders or segments in society. So coming to your question about

whether the work in Parliament is different than the work in my day job, academia they are different in many ways but also similar in other ways.

I guess my academic job is more focused on research and education. Doing lots of working on research projects and training new Ph. D. students. Where else the work in parliament is more about educating the public, more about being involved in policy discussions, debates about voting for new bills and so on.

Although they are similar in the sense that my speeches and my involvement in parliamentary debates are usually around the topic of the environment on sustainability. Similar kinds of issues to my academic work.

[00:02:50] **Susan Kish:** So the issues overlap, and the role and importance of education and articulating and communicating things sound like they overlap. But it just sounds like your audiences are different.

[00:03:00] **Lian Pin Koh:** That's right. Very different.

[00:03:02] **Susan Kish:** Understood. How did you start being interested in the area of biodiversity and the environment?

[00:03:12] **Lian Pin Koh:** Good question. I grew up in Singapore in the 1980s. That reveals my age a bit, huh? But I

[00:03:23] **Susan Kish:** That's right.

[00:03:23] **Lian Pin Koh:** I was probably the last,

[00:03:25] **Susan Kish:** It is published on Wikipedia. You're good.

[00:03:27] **Lian Pin Koh:** that's right. I was probably the last generation of Singaporeans to have had some experience of living in a more village like environment, a more rural environment.

So I remember on the weekends, my parents would bring my sister and myself to visit our grandparents in the more rural parts of Singapore. And I spent a lot of time, catching... Spiders catching butterflies just,

[00:03:53] **Susan Kish:** Butterflies, spiders, not so much.

[00:03:57] **Lian Pin Koh:** Yeah, we catch them to fight. They are jumping spiders that you can catch and then you can have a combat between two spiders, two jumping spiders.

It's one of those things we used to do in Singapore

[00:04:07] **Susan Kish:** Okay. All right.

[00:04:08] **Lian Pin Koh:** as kids. So that experience was wonderful, but as I grew up, that opportunity to interact with nature began to... be replaced by of course higher, high rise buildings urbanization, urban sprawl. And eventually there is less of the opportunities to do such things.

But then on the other hand I benefited from the development, the pace of development in Singapore, the economic payoffs and so on. So growing up from young till my college days in Singapore. I've always grappled with this duality of having an affinity towards nature but then also at the same time understanding the need for economic development.

So when I went to do my PhD and then later on in my post doc my research has always been trying to figure out how to reconcile these two priorities.

[00:05:10] **Susan Kish:** What was your thesis about? I did read that it was trying, this question of how do you manage the needs to preserve an ecosystem and give environmental protection with what society actually needs? Because you're right. I think of Singapore and I think of expressways and high rises.

I do not think of any kind of village or other kind of system.

[00:05:32] **Lian Pin Koh:** So my PhD work, that's prior to my joining ETH, was on the environmental impacts of oil palm agriculture in Southeast Asia. That was

[00:05:46] **Susan Kish:** This is when you were at Princeton?

[00:05:49] **Lian Pin Koh:** This was when I was in Princeton early 2000s. I did most of that work back here in, in the region, in Southeast Asia. In fact, I had the opportunity to live in an oil palm plantation for a couple of months during my PhD work. So it started with me, being very interested in understanding the impacts of oil palm agriculture on biodiversity, on native wildlife and forests. But as I got the opportunity to interact with the plantation managers, with the local communities again I began to see the local perspective, to understand why there's a need to also be planting oil palm and to grow that sector.

So again my PhD thesis ended up being, It was, the title actually reviews my thesis. It's it's the Oil Palm Conundrum. Understanding the environmental impacts on the one hand, but then also understanding the economic importance of oil palm for the countries that are big growers of that crop.

[00:06:48] **Susan Kish:** Now, Lian Pin, wait one sec. When you say oil palm, is this palm oil or is this like

[00:06:53] **Lian Pin Koh:** Yeah, it's palm oil.

[00:06:54] **Susan Kish:** Black oil? It's palm oil.

[00:06:57] **Lian Pin Koh:** oil. Typically we refer to the plant and the fruit as oil palm, and the oil as palm oil.

[00:07:03] **Susan Kish:** Oh, that's interesting. Okay. Thank you. I didn't realize that. I was thinking you were talking about drilling for oil. Ha.

[00:07:10] **Lian Pin Koh:** no.

[00:07:11] **Susan Kish:** Got it. And what was it you worked on when you were at the ETH? You came there to do a post doc?

[00:07:17] **Lian Pin Koh:** I went to the ETH right after graduating from Princeton. The first project was really an extension of my PhD work in that I started to look at how Palm oil is being used for biofuels around the world. At that time, it was there was a great interest in biofuels and biodiesel. And I was looking into how that might be, basically the pros and cons of doing so.

Because on the one hand, you would be replacing, you could be replacing fossil fuels with biofuels, but on the other hand, if we convert our forests to grow more oil palm, for example, then you would also have an environmental impact in another way. So again, it's grappling with these complexities. Then later on after my postdoc, still at ETH I was fortunate enough to be awarded a Swiss National Science Foundation professorship.

And so I started or began as a, an assistant professor at ETH for a few years before moving on. Yeah.

[00:08:21] **Susan Kish:** And was it also at the ETH where you started to be interested in drones?

[00:08:26] **Lian Pin Koh:** Yes, I,

[00:08:28] **Susan Kish:** how did that start? Because that feels like a jump.

[00:08:29] **Lian Pin Koh:** Hehe

[00:08:30] **Susan Kish:** Speaking of spiders.

[00:08:32] **Lian Pin Koh:** Not really. It's all connected in some way. During my oil palm work, I was also very interested in the biodiversity that, that was being affected by oil palm expansion in

Especially in Indonesia, parts of Indonesia. One of my colleagues Professor Serge Wiech who had been working for many years in Indonesia on orangutans and how orangutans are affected by oil palm, came over to ETH one of the cafes and we just sat around.

I was talking about oil palm agriculture. I was talking about orangutans. And then somewhere along the way during our conversation, I also mentioned Switzerland is great for flying remote controlled gliders toy planes,

[00:09:17] **Susan Kish:** Yes, that's right. They have fields and clubs and it's a big deal. Yeah.

[00:09:22] **Lian Pin Koh:** And then we joked about how maybe we can just stick a compact camera underneath one of these glider planes and fly them over the forest in Sumatra, Indonesia. And maybe we can use that to detect orangutan nests. That would enable us to count them and study their populations. So that was the genesis or the beginning of the idea of conservation drones.

[00:09:47] **Susan Kish:** Very cool. Because in your TED talk you talk about, you just, it's basically a model aircraft and you add a small computer and a camera and a couple sensors and a GPS and voila, you're done, right?

[00:09:58] **Lian Pin Koh:** And the amazing thing was neither of us was a computer scientist or an engineer, so we had no knowledge of how to put those things together. But thankfully the internet is a great resource. We could find all the information we needed and we had some time to play around and finally got it to work.

[00:10:17] **Susan Kish:** Got it. Let's talk about biodiversity for a sec. Biodiversity hit the headlines in December when the COP meeting in Montreal put together, what was it called, the Global Biodiversity Framework. Just wondering, especially at that time you were still having two hats, the politician and the scientist.

What is your sense about the urgency around biodiversity? And are we on the right track to start to addressing it? What's our status here?

[00:10:48] **Lian Pin Koh:** That's right. And the other event that sort of happened overlapped at around that time was, of course, everyone was coming out of the pandemic, right? The COVID pandemic.

[00:10:59] **Susan Kish:** Right.

[00:11:00] **Lian Pin Koh:** So in many of my conversations and also my discussions with stakeholders I always like to remind people I'm talking to of the fact that even though we are coming out of the pandemic there are actually two even bigger and in many ways more insidious crisis or challenges that the global community is facing. And one of them, of course, is the climate challenge. But the other equally serious one, significant one would be the biodiversity crisis.

And in, in some ways the world has... been paying more attention to the climate crisis. There are lots of international frameworks and efforts being supported and being developed to drive climate action. Of course, although much more can be done. But then when it comes to biodiversity short of the Kunming-Montreal conference and what followed from that I think

we are still lagging far behind compared to the efforts that we are putting into addressing the climate crisis.

I also like to add that in fact, the climate crisis and the biodiversity crisis are closely intertwined.

Both in terms of their impacts on society, and also their solutions. Which is why when I came back to Singapore three years ago, after having been around for 16 years all over the world, when I came back to Singapore three years ago, I set up this center for nature based climate solutions.

Looking at the nexus between nature and climate.

[00:12:34] **Susan Kish:** Very cool. What caused you to return to Singapore?

[00:12:38] **Lian Pin Koh:** A couple of reasons. on the personal front, of course our parents, the parents of my wife and mine are getting old. No, they are now in their seventies. So there's always

[00:12:49] **Susan Kish:** That's not old.

[00:12:52] **Lian Pin Koh:** They kept telling us they kept telling us they are getting old.

[00:12:58] **Susan Kish:** And you listen to them?

[00:13:00] **Lian Pin Koh:** Yes there's always that I guess cultural practice or desire or yeah to come back and to spend more time with them. So that's why we came back, my wife and I, but professionally I think it's also a good time to come back to Singapore given the amount of attention now on sustainability efforts.

How Singapore is wanting to transform itself into a more sustainable city wanting to be a climate services hub, to provide services. For the rest of the region and Singapore also has a problem in terms of lack of talents in this area. I having been away for so long and having had some experience in this area, I decided to come back and see how I could potentially contribute.

[00:13:50] **Susan Kish:** Very cool. How did your years at the ETH as a postdoc, as an assistant professor, as a self-taught technology entrepreneur how did those years at the ETH prepare you for what you want to do and where you're going?

[00:14:08] **Lian Pin Koh:** I think it's my formative years that and also my years in Princeton, in that I was exposed to an international community, a much more international community than, for example in Singapore when I was in college. So I had to understand how the different cultures are interacting with one another in a very multi-cultural environment like ETH.

I also as a part of the training to be an academic or researcher, got to interact with excellent professors and colleagues and fellow scientists. That also contributed a lot to my ability to grow as a scientist. And geographically, I think the opportunity to be at ETH in the midst of many other excellent universities and research centers in Europe also allow me to easily interact to just travel over to the UK, to Germany, and all the other parts of Europe and interact with an even larger cohort of scientists.

And all of those things, I think, were very valuable experiences for me in my training as a scientist.

[00:15:22] **Susan Kish:** You've published pretty widely, if I understand correctly, and had oodles and oodles of citations. Like 24, 000 or something crazy. Are there professors you still stay in close touch with at the ETH?

[00:15:35] **Lian Pin Koh:** Yeah, sure. My mentor when I was a postdoc was Professor Jaboury Ghazoul. I believe he's still there still leading his ecosystem management laboratory.

In fact after I left, even when I was there I began to introduce other students and researchers from Singapore to join his group.

So there have been at least one other Singaporean scientist that passed through his lab.

[00:16:03] **Susan Kish:** Lian Pin, you mentioned you were away from Singapore for 16 years before you came back three years ago. What did you do in those 16 years?

How did, can you describe how that laid out?

[00:16:15] **Lian Pin Koh:** Yeah sure. Interestingly I, The reason, one of the reasons I left Singapore was because before I left, when I was still in college in NUS in Singapore, I went for an interview, a scholarship interview. And in telling the interviewer that I studied, I was studying butterflies and birds he told me, oh, butterflies and birds can't make money for Singapore.

So I left. That was in the early 2000s.

[00:16:41] **Susan Kish:** Now you left because you didn't think he had enough imagination, or you left because you thought, I want to go to a place that, I want to go find something that will make a difference for Singapore.

[00:16:51] **Lian Pin Koh:** Both. Also because I wouldn't... be able to find a job in Singapore if I stayed. So I left in the early 2000s. I went to the U. S. To a nice college town in New Jersey. That was Princeton University. And studied ecology under the tutelage of Professor David Wilcove who was in the School of Public Policy and International Affairs.

After being in Princeton for four years, three or four years went over to Zurich, of course joined ETH as a postdoc, and then started my assistant professorship for a couple of years.

Then started applying for a proper job because those were not tenured jobs. I got an offer from two places, one of which was the University of Adelaide in South Australia.

Eventually I accepted the offer, went over to Australia, spent five years there as a professor, first as an associate professor and then got promoted to a full professor.

That was also coinciding with my, the time I started experiencing or having a midlife crisis. I was 40 actually when I was promoted to full professor.

And suddenly...

[00:18:03] **Susan Kish:** pretty young, right? As far as I understand, in the world of academia. Yeah, exactly.

[00:18:09] **Lian Pin Koh:** So I was I kept asking myself,

[00:18:10] **Susan Kish:** done.

[00:18:12] **Lian Pin Koh:** Am I done? Am I gonna, Yeah, what am I gonna do for the rest of my life? So I So I started Being more involved and started engaging with the NGO world, And that's how I started to be. Involved in some of Conservation International's efforts in the region, got to know them, and eventually was offered a position with CI back at, in the US and so I left.

[00:18:36] **Susan Kish:** CI is Conservation International,

[00:18:37] **Lian Pin Koh:** Conservation International, sorry, yes. So I gave up my tenure to the horror of my wife,

[00:18:45] **Susan Kish:** And I'm sure your parents, who are very proud of you.

[00:18:47] **Lian Pin Koh:** Yes, but I don't think they really understand what this tenure thing is, it's very abstract for most people. But anyway, I gave up tenure, left Australia and went back to the US, but this time I managed to negotiate with my employer, with Conservation International, for me to be working remotely out of Seattle, because I never lived on the West Coast, so I thought, maybe we should give it a go.

So we moved to Seattle.

[00:19:13] **Susan Kish:** coffee there, from what I understand.

[00:19:17] **Lian Pin Koh:** Yeah, excellent coffee. And so we lived there for two to three years, before this opportunity in Singapore came up, and for the reasons that I described, I came back to Singapore.

[00:19:29] **Susan Kish:** Got it. So it allowed you to see a different kind of rainforest too

[00:19:31] **Lian Pin Koh:** yeah, exactly. Very different from the ones I'm familiar with.

[00:19:37] **Susan Kish:** Very cool. Thank you. I would love to close by asking a few questions that we always try to address in these conversations, if that's okay. But Lian Pin, thank you. That was a great overview about a really interesting and high impact journey.

[00:19:53] **Lian Pin Koh:** Thank you.

[00:19:56] **Susan Kish:** So I understand that you are a science fiction fan that you like science fiction movies.

So tell us, what are your top three? I'm a little bit of a nerd as well, so we can have a good debate on this one.

[00:20:11] **Lian Pin Koh:** I guess my top one would be... The maybe a bit of a cliché, it's Star Wars and all the universe of movies and now TV series associated with that universe of Star Wars. The second one is Foundation

[00:20:27] **Susan Kish:** You're right. It caused me to reread the books, right?

[00:20:31] **Lian Pin Koh:** Great. So those are my top two. I don't really have a third. I think I'm quite obsessed with those two.

[00:20:40] **Susan Kish:** Okay. Given the number of spin outs, I can understand that. And what about books or podcasts? What kind of books or podcasts do you like to either read or listen?

[00:20:50] **Lian Pin Koh:** I used to read. I don't have much time nowadays to read and podcasts is still something very new to me. I grew up not listening to podcasts, so everyone is telling me to get into the habit. But when I was, when I had time to read, I remember growing up reading lots of popular science books.

Dawkins is one of my favorites Richard Dawkins.

so he wrote The Selfish Gene, for example, which had a huge influence on my understanding of life, of human behavior, and so on. And then he had a couple of other equally fascinating science fiction books.

I also was I was heavily influenced by, or not influenced anymore I guess, but at that time when I was younger those pop philosophy type of books I remember reading and being captivated by Zen and the Art of Motorcycle Maintenance.

[00:21:45] **Susan Kish:** because it was a great book.

[00:21:47] **Lian Pin Koh:** Yeah.

[00:21:48] **Susan Kish:** The Zen and the Art of Motorcycle Maintenance,

[00:21:50] **Lian Pin Koh:** Yeah, I think so. I think so. Yeah, I think that was what it was called. It just conjured up I don't remember the details anymore. It was too long ago. But I just remember being fascinated by the idea of being on a bike riding through vast expanses of land, and then being able to think about those philosophical questions.

Yeah. Yeah, so those are some of my favorites.

[00:22:12] **Susan Kish:** That's great. In your years in Zurich, as you described, you said there was a cafe that you went to hang out where you had this pivotal conversation. What were your favorite places in Zurich?

[00:22:26] **Lian Pin Koh:** I think that Green Café, I think it's called Green Café. It's just a, sort of a courtyard within the building I was in. It's where all the students and staff would be gathering for their tea breaks or coffee breaks. So that, that's one of my favorite places to go to hang out. The other one would be around the lake, of course.

I remember spending lots of weekends, just walking around the lake going on that ferry to what's the town on the other side of the

[00:22:52] **Susan Kish:** Rapperswil?

[00:22:53] **Lian Pin Koh:** That's right, Rapperswil.

[00:22:55] **Susan Kish:** That's beautiful, that's a long, but just lovely ride.

[00:22:59] **Lian Pin Koh:** It's just on that ferry and they're just doing nothing, just enjoying the sights and and having a sip of my favorite Swiss beverage Rivella.

[00:23:10] **Susan Kish:** Ah, really? I never developed a taste for that one.

[00:23:13] **Lian Pin Koh:** I love it. Every time I go back I'll have to get a

[00:23:17] **Susan Kish:** The blue one. I was going to say, which color? Okay, good. We'll remember that.

When you were young, you described growing up in a different kind of Singapore. But what did you want to be when you grew up?

[00:23:30] **Lian Pin Koh:** When I grew up or when I

[00:23:33] **Susan Kish:** So let's say you were 10 years old. What did you want to be when you grew up?

[00:23:38] **Lian Pin Koh:** Maybe not when I was 10 years old. Maybe when I was like 12, 12,

[00:23:42] **Susan Kish:** that's fair.

[00:23:44] **Lian Pin Koh:** I actually wanted to be a musician. I was very interested in music. Like most Singaporean kids. My, my parents sent me to piano lessons and guitar lessons.

But I was more interested in songwriting in singing in a group. I was part of a boy band actually

[00:24:02] **Susan Kish:** Ah, that's the best.

[00:24:04] **Lian Pin Koh:** And we

[00:24:08] **Susan Kish:** I going to find any recordings in MySpace?

[00:24:10] **Lian Pin Koh:** No, it was all in, in Mandarin or Chinese. But we wrote our own songs, we went for competitions, we won a few

[00:24:16] **Susan Kish:** How cool!

[00:24:18] **Lian Pin Koh:** at one point I even told my parents, I'm going to quit school and just go to this college of audio engineering or whatever. That freaked them out.

Thankfully they were very nice, they talked me through the reasons why I should, at least complete my college education, which I did, and then I gave up on that silly idea and, yeah, went on the

[00:24:40] **Susan Kish:** It might not have been a silly idea. You just never know, Lian Pin.

[00:24:44] **Lian Pin Koh:** Maybe, but I'm very happy with what eventually happened.

[00:24:48] **Susan Kish:** I understand. And what sparks your curiosity today? You're still what is it that you would like to learn about?

[00:24:56] **Lian Pin Koh:** I think I am motivated by figuring out how to motivate people to act to address the challenges that we face.

[00:25:07] **Susan Kish:** How to make them do stuff.

[00:25:09] **Lian Pin Koh:** make them take action quicker and make bolder action, do bolder things for the climate and also for biodiversity.

[00:25:18] **Susan Kish:** Thank you. And now I have a final question for you. Lian Pin, you have the greatest scribbles and drawings and diagrams on that wall behind you. What is on that wall? Tell us about that.

[00:25:30] **Lian Pin Koh:** Lots of ideas.

[00:25:32] **Susan Kish:** Can I get a wall like that? This feels really boring.

[00:25:35] **Lian Pin Koh:** So I was lucky enough to be given a new space when I came back to Singapore. We now have actually about 50 people in the center that I set up including four professors, and the rest would be students and researchers. When they renovated, this space for the center.

I asked them to just paint the wall something that I can write on. So they made it a whiteboard essentially. So these scribbles are things that my students and staff and I we'll be discussing whenever we have our meetings. And they're just some random collection of thoughts and ideas.

Some of which actually resulted in more publications. There,are also, of course, passwords which maybe is not a good idea.

[00:26:24] **Susan Kish:** We won't go into detail there. We're not going to zoom in.

[00:26:28] **Lian Pin Koh:** Okay.

[00:26:30] **Susan Kish:** Lian Pin, thank you. Thank you so much for your time. Thank you for a great conversation and letting us hear some of the stories about your journey. Really appreciate it.

[00:26:38] **Lian Pin Koh:** Thanks very much, Suzanne. I really enjoyed the conversation with you too.

[00:26:42] **Susan Kish:** Fantastic. I'm Susan Kish, host of the ETH series, We Are ETH, telling the story of the alumni and friends of the ETH Zurich, the Swiss Federal Institute of Technology. ETH regularly ranks amongst the top universities in the world with cutting edge research, science, and people. The people who were there, the people who are there, and the people who will be there. Take a moment and subscribe to this podcast and join us on whatever platform you use to listen and give us a good rating on YouTube, Spotify, or Apple if you enjoyed today's conversation. I'd like to thank our producers at Ellie Media and ETH Circle and thank you, our listeners, for joining us.