



Ear to Asia podcast

Title: The demand for sand, and its impact in Asia

Description: Ambitious construction programs for infrastructure and housing in Asia and elsewhere are leading to skyrocketing use of concrete, of which sand is a key ingredient. Mining of sand, a surprisingly high-stakes enterprise, comes with considerable human and environmental costs. Development researchers Associate Professor Melissa Marsche and Dr Vanessa Lamb join host Peter Clarke to pick the winners and losers in the often murky business of sand extraction in Asia. An Asia Institute podcast.

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Voiceover: The Ear to Asia podcast is made available on the Jakarta Post platform under agreement between the Jakarta Post and the University of Melbourne.

Peter Clarke: Hello, I'm Peter Clarke. This is Ear to Asia.

Melissa Marschke: Sand Scarcity is real. It's the environmental crisis we haven't been thinking about. We are extracting more sand than is being replenished. A crisis will emerge and it's something we have to deeply think about.

Vanessa Lamb: If you think of a road or a new factory or government buildings being built in your provincial town, those might be benefits to you as a resident but I think the larger scale and scope of sand extraction going to Singapore definitely doesn't feel to most people that that's fair.

Peter Clarke: In this episode, the demand for sand and its impact in Asia. Ear to Asia is the podcast from Asia Institute, the Asia Research Specialists at the University of Melbourne. Sand, that humble, granular material many of us fondly know from beaches and playgrounds has become the most in demand of natural commodities and the world's appetite for it is showing no sign of letting up. Ambitious construction programmes for infrastructure and housing development across the globe and in particular in the rising economies of Asia are leading to skyrocketing use of concrete, of which sand is a key ingredient.

With growing urbanisation and rising living standards set only to boost demand, many observers are increasingly voicing concerns about the human and environmental costs of extracting sand, which is effectively a nonrenewable resource. Who are the winners and the losers in the surprisingly high stakes enterprise, which the United Nation Environment Programme has called one of the major sustainability challenges of the 21st century? With us to examine the business of sand with a particular focus on



how that business operates in Asia, are Human Geographer, Dr. Vanessa Lamb from the University of Melbourne and Resource Management Researcher, Associate Professor Melissa Marschke from the University of Ottawa who joins us via Skype. Both our guests carry out on the ground research in Southeast Asia. Melissa, Vanessa, welcome to Ear to Asia.

Vanessa Lamb: Thanks Peter.

Melissa Marschke: Nice to be here.

Peter Clarke: Vanessa, let's cut to the chase. What is actually driving this demand for sand?

Vanessa Lamb: I think it's actually a bit complicated. So there's the straightforward answer which is that basically the way we live today depends on sand. The concrete that is part of our buildings and our foundation for infrastructure is made from sand. I think it's two thirds sand to one part cement and then one third water and aggregate. But there's other parts of the demand for sand that maybe aren't as big in the picture. Things like glass and microchips that we use as well as the beaches that you mentioned. So those are all part of this larger demand for sand. But I think what Melissa and I really focus on is the construction industry and land reclamation.

Peter Clarke: That has the lion's share of this demand for sand. And Melissa, sand ain't sand as I've learned reading the research behind all this because we think of sand perhaps out in the desert, those vast dunes. Why aren't they being mined? Is that sand not good enough? Not the right sort of sand for concrete?

Melissa Marschke: Exactly. That sand doesn't work for concrete. It's too round and it doesn't stick together to actually make concrete when it gets mixed in. So the only type of sand we can really use for building material is river sand or it's the best quality of sand. Even sea sand, which is often used for infill and could be used cheaply for construction isn't really a good go. It's river sand or estuary sand that's ideal and it's the sticky quality when being turned into cement is why we use that type of sand.

Peter Clarke: That sounds to me like the degree of erosion or the amount of working the sand is experienced in that erosion process.

Melissa Marschke: Yeah, it's a highly geophysical process. I know there's R and D going on around desert sand and can we make it stick better, but that's a lot like fracking or what we do in the oil sands when we can't get oil easily. It's super, super expensive. That's not really the way sand is usually obtained. And most of the dredging is taking place in Asia because sand there is super cheap and that's why so much of it is sought after in places like Singapore and beyond.



- Peter Clarke: Vanessa, I just want to make it absolutely clear, when we use that phrase, sand mining, I grew up on the East coast of Queensland. We saw the dredgers charging up the beaches. That wasn't that sort of sand mining. That was sand mining for minerals.
- Vanessa Lamb: Yeah, and that's a much higher value commodity. Although I think you could say that both of these kind of extractive activities are going to have ecological and social impacts.
- Melissa Marschke: Yeah. The scale is maybe what is the difference, right? So when you're going for high value minerals you might not need as many because it's very selective, but we've been seeing that for decades. It's now the amount of sand that's being dredged and all qualities of sand that are being dredged.
- Vanessa Lamb: Maybe another key difference here is that linked to the scale and the scope that Melissa is talking about, it's very specific so you would really go and survey very clearly first to know where the highest value and highest quality for your extraction activities are going to be for minerals. For construction sand or infill, it's really more of like a broad scale, let's collect everything. And I think that's what Melissa and I see most. Let's imagine a river system and most in mainland Southeast Asia are going to have alluvial islands, islands that are basically sandbars that pop up seasonally, so they might not be there every year. But during low water season you're going to see a lot of sandbars. Some people might cultivate agriculture on those. And those as well as river banks and other parts of the bed of the river are actually just being wholesale scooped up and removed as part of these sand extraction activities. Where I think with mineral sands it would be much more targeted and specific in my experience.
- Peter Clarke: From your description then we're talking about water flows and we're talking about seasonal water flows, aren't we? The building up of those alluvial islands and the dropping away of those. The big floods that sometimes rip through. So it is about waterflows but as you start to describe the hollowing out Vanessa, that inevitably must affect water flows.
- Vanessa Lamb: Yeah, so I do have physical geographer colleagues who work on some of the links between for instance, rates of sand extraction and the direct impacts based on modelling of erosion and sedimentation downstream. And some of that research has already been published. For instance on the Mekong River where they are seeing now they can make claims that there are impacts. There are actual impacts from removing the sand. The rate of the river flow can increase and you have increased erosion and sedimentation as a result of those. So some people have been quoted in the news quite often actually. They just see entire river banks crash into the river where they used to either cultivate or even sometimes live. And so those kind of activities are now actually being linked to sand mining and extraction.



Peter Clarke: I think we'll explore that just a touch further in our conversation. Melissa, let's stay with scale for a moment, and this is a hard question to imagine the answer to. How much sand is actually mined annually across our planet?

Melissa Marschke: We don't have a good estimate, but we think 40 to 50 billion tonnes annually. That will make enough concrete to build a wall that's 27 metres or 89 feet wide by 29 metres high around the planet every year. It's the largest extractive industry globally. So it's a large amount of sand. And the data we have really is only focused on international exports. A lot of countries aren't actually claiming internal sand dredging amounts.

Vanessa Lamb: Well can I add, I was going to say that the estimates for how much it's worth are also really interesting. So these are also very incomplete for a number of reasons and they're just estimates but they range from \$70 billion globally for a sand extraction industry to more modest estimates of like 1.7 to \$2 billion.

Peter Clarke: That's a big discrepancy.

Vanessa Lamb: It is, yes.

Peter Clarke: Your research and Vanessa's research tends to centre in that Southeast Asian area. Why is it that Cambodia for example in Myanmar are now important primary sites for sand mining?

Melissa Marschke: I think they each actually have a different story and Vanessa for sure can speak more to Myanmar than I can, but maybe Vanessa jump in as I explain a bit about Cambodia. Cambodia in a way was a silent player for over a decade and it only came to the fore when a really savvy NGO, Cambodian NGO was able to use UN comtrade data to actually show that Singapore had imported something like 80 million metric tonnes of sand from Cambodia in a decade. And Cambodia had only claimed something like two and a half million metric tonnes. And so there was a huge amount of missing sand. And as they campaigned about it, people got really upset at the idea that elites were yet again making money out of yet again another resource in Cambodia. And that really started huge pressure in the last couple of years, which led to an eventual ban.

But for a decade, sand mining was quietly going on on the coast and it was super far from state power. A lot of money was being made. From what we understand, those in control of sand mining were very well connected politically and with the business elite. And so nobody really could stop it. And it was a handful of villages that kept protesting. Doing fingerprints, commenting on how their fishing grounds were being impacted. But nobody cared enough to listen and it was too powerful to really handle. So in a sense, it's impressive that this campaign emerged to put Cambodia on the map and also that the media picked up on it and et cetera. But meanwhile,



Singapore has hugely benefited in terms of their construction industry and their infill.

Peter Clarke: Let's come back to Singapore in a moment, but just keeping the spotlight Vanessa on Myanmar, Melissa said it's a slightly different story between Cambodia and Myanmar.

Vanessa Lamb: I think maybe the resource politics story is a bit true in both, but I think in Myanmar there have been changes in neighbouring countries like in Cambodia or Indonesia or Malaysia where they actually instituted bans on sand mining or export. And that was mainly focused on export to Singapore because the amounts were so large and there was internal political organising around those issues. And so I think Myanmar has actually picked up a little bit of that slack, let's say. And at the same time as the sand bands are going on in the region, you have changes in Myanmar. Political, economic and social changes since 2010 that have seen an opening up economically and politically.

You have these kind of changes happening around the same time and so I think that's part of the rise in sand mining and Myanmar is linked to those broader changes and again in Myanmar you have a mix. There is definitely sand that's being exported to Singapore even by Myanmar's own reporting estimates. But you also have a rise in urbanisation and development in Myanmar as a result of removal of economic sanctions. You have a kind of complex picture where you've, since 2010 definitely just had a rise in sand mining both domestically for use in developing roads and also for export.

Peter Clarke: As an extractive industry, I'm just imagining here going to Myanmar to a river there or to Cambodia Melissa. A relatively easy peasy industry, isn't it? You scoop the sand up with dredgers I guess and stick it into trucks. Is that about it?

Melissa Marschke: Well, it is relatively easy peasy, particularly in Cambodia or Myanmar, although there's some labour issues in Myanmar, but relatively speaking, yeah, you're talking about a dredger. You go out into the middle of a river or into a estuaries and you pump sand into a barge. If it's being exported, it's going to be then traded onto a larger barge and then sent off, whether it's Singapore, India or somewhere else within a water right away. And if it's river sand then there's huge dumping stations all along the Mekong and the sand is dumped and then it gets scooped up and it's the river sand that tends to be used domestically in Cambodia at least for construction.

Peter Clarke: So along the banks of the Mekong one can see these pretty gigantic piles of sand. A bit like you'll see in salt mines in some places, certainly in Australia. Gigantic piles of sand. Is that what we're seeing?



- Melissa Marschke: Maybe not gigantic, but it's a very visible overt operation and I mean in Cambodia I've always said there's two parts to it. It's the quiet extraction that took place to Singapore at a huge magnitude. And then there's this everyday boom of just chipping away at the river to get your sand to build your house or for the real estate boom or for infill of all of Phnom Penh's wetlands.
- Vanessa Lamb: Yeah, I was just going to say, I think the reason that you don't see along the Mekong necessarily huge piles of sand is because a lot of that sand might be going for local use and it's used quite frequently. What I've seen for instance on Salween and Irrawaddy Rivers in Myanmar is that sand for export would directly go on a large ship. So it's not really the sand that's necessarily sitting around, but I would guess that also keeping a specific kind of more pure sand that doesn't mix with other kinds of sand also would get a better value potentially.
- Peter Clarke: You both mentioned Singapore. Let's examine the Singapore story more closely. Something I was very surprised by and when I mentioned Singapore and sand mining to people, they just look at me quizzically. What is the backstory on Singapore and sand mining? Melissa?
- Melissa Marschke: Well, Singapore is sort of a major hub in the region and they're an island state and so they don't have a tonne of land. And so they have a choice of either building up or building out and they've chosen to do both. And in building out they've added 20% onto their island state, so that works out to be 50 square miles or 128 square kilometres to its original land area. And you can really see this with satellite imagery over the years of Singapore just slowly building out. And they've been going at it for 20 years and so this has been a long term project. And this is partly because as you get bigger you can claim more of your sea to be yours and that has lots of potential in terms of oil and gas, et cetera, but also just in terms of landmass. And then the other thing Singapore is doing of course is building up.
- So everybody has these images of Singapore with its gigantic high rises and that has just continued. Singapore has no sand, so they have to get it from somewhere. And it's been shifting where Singapore buys its sand and I think it's partly like two bands that might actually get enforced in the region, which is up and down, but also the price. And so the more recent boom of Cambodia and then Myanmar coming on is really about it's the cheapest way to get your product to you. And so labour is cheap, the barges is cheap, and the sand is really cheap.
- Peter Clarke: Melissa, who are and have been the main suppliers of sand to Singapore?
- Melissa Marschke: Oh, it's varied over the years, Indonesia supplied a lot of sand. Malaysia, Vietnam, Cambodia, Myanmar. It's been very regional. The Philippines as well. And so as the Philippines, Malaysia and Indonesia saying, "Whoa,"



realising the impacts of sand mining. So we talked about islands disappearing as they would get scooped up. But also there's a lot of destruction to fish habitat and ecological change in terms of habitat for birds, et cetera. So you really notice shifts in the ecosystem with a lot of mining or dredging.

Peter Clarke: Are you saying that whole islands in the archipelago disappeared through sand mining?

Melissa Marschke: Yes. They estimate in Indonesia that at least 24 islands were removed since 2005 because of sand mining and that's similar to what Vanessa has been observing in her research as well.

Vanessa Lamb: Yeah. I was also just going to add to the Singapore picture though. One of the interesting things is that in 2014 there was this UN report which really I think shone a spotlight on Singapore and its relationship to other regional trading partners like Cambodia with regards to sand. And I think Singapore lost a bit of face. They were a bit embarrassed about this. What was really positioned as you know you're extracting resources from poor developing countries and you're developing then essentially at the expense of other countries that are less developed like Cambodia. What has happened in Singapore since then is a shift let's say, or at least a trying to shift the narrative.

There's been a lot of talk in press releases and in the news media coverage about alternatives for sand, which I think is really interesting. Still like proceeding on the same development path where you're building Singapore up and out. But some of the ways that they're talking about doing land reclamation, building out, are linked to less intensive methods that wouldn't require so much sand like poldering, which is a Dutch approach to pushing back the seas in order to both contain rising sea levels, which is a challenge for a country like Singapore and to have land that you can develop on.

Melissa Marschke: Although if I can jump in, I was just looking at the Comtrade data for 2018 and it's very comparable to every other year.

Vanessa Lamb: Increased, yeah.

Melissa Marschke: Yeah, it's increased in 2018. I think that's good that Singapore is looking for alternatives and I imagine they're no longer, for example, buying from Cambodia, but they're definitely buying from many other places in the region still.

Peter Clarke: Let's go to China because that's an enormous country as well. We've been talking about Singapore, what's the profile of China in terms of their importing of sand and their use of sand?



- Vanessa Lamb: So in 2016 David Harvey, who's a very famous geographer, so one of our key thinkers, he started writing about the construction boom in China. And he has some great quote that compares cement and sand and concrete use in China to that of the U.S. And he says that in three years in China, the country used more cement than the U.S. did throughout the entire 20th century. Just pointing to this giant construction boom that did require concrete for development in China.
- Peter Clarke: China has its own domestic sand suppliers as well as importing.
- Vanessa Lamb: Yes.
- Peter Clarke: Does it confront internally some of the same problems that we're starting to sketch out in Myanmar, in Cambodia and other affected communities? Does it affect its own community?
- Vanessa Lamb: Oh yes, definitely. There's a really well documented case in Poyang Lake outside of Shanghai and I believe the lake was actually a secondary site for sand extraction for the development of Shanghai because the river system that was flowing into the city, actually some of the bridges collapsed on the river because the banks were eroding so fast because of the extraction. And then the lake, it also lost its fisheries as a result of extraction. So that's a well documented case in the 80's, 90's. But there's a PhD student in my department that's looking at sand mining in other rivers and you see a similar situation where you have large amounts of sand being extracted from rivers for removal and development of cities, and then local impacts like river banks closing in and alluvial islands being removed completely from cultivation.
- Peter Clarke: Melissa, did you want to add to that?
- Melissa Marschke: Yeah, I actually think there's really good science on China. I've been doing a literature review across Asia and the most material for sure focuses on China by Chinese academics. And you see examples of species loss, of river flows shifting, of sedimentation changing and also acknowledging how all of that is intersecting with the building of dams, which further complicates things. Climate shifts as well. And of course, yes, fish stocks absolutely have been decimated across China. I mean that's part of the whole turn to fish farming, but China really is at the forefront in a sense of all of those physical, environmental shifts that come with a massive sand industry because it's been happening for so long.
- Peter Clarke: You're listening to Ear to Asia from Asia Institute at the University of Melbourne. I'm Peter Clarke with guests Associate Professor Melissa Marschke and Dr. Vanessa Lamb and we're discussing the impact of sand mining in Asia. Vanessa, let's go to some of the people who were living there before the sand mining started who are living there during the sand mining,



some of whom have had to go elsewhere. Let's examine some of those communities. Going to Myanmar, can you paint a picture of a mini case study for us of what happens to communities when sand mining on the sort of scale we've been describing actually is undertaken in their communities?

Vanessa Lamb:

Yeah, so along the Salween River in Myanmar, the Salween's a transboundary river that also goes through China and Thailand, but in Myanmar where the lower stretch provides food and livelihood like fishing and agriculture for millions of people, I think two of the large impacts have been on those livelihood activities. Some of the work that I'm doing has been looking at the impacts on agriculture. So that's both people planting crops on alluvial islands or sandbars in the river, which is a seasonal practise but provides food security and cash for local residents. And also the floodplain agriculture in Southeast Asia is pretty common. If you've been along a river, you've probably seen this, but basically because of the seasonal monsoon, you have flooding, which deposits this rich sediment, sand, into the floodplain and then that area is used for agriculture.

So that could be directly along the banks. It could be a much larger area. But that's I think a longstanding seasonal practice, again, for food security and cash for just everyday life for supporting families. And so those two, as you can imagine, are directly competing for the same sand as the sand miners who also want to scoop up those islands and some of the rich deposits and the river bed or on the bank. So it's both a direct competition, I think for the, let's call it sand is land for agriculture. And then it's also for these sediments, which are moving through the river, which provide nutrients for agriculture. And I think Melissa can speak much more to the fisheries angle, but I have heard from interviewees that this is also an impact.

And if you can imagine just large shovels bringing up the river bed, that's obviously going to impact lots of parts of the ecosystem of the river. And so those are going to have effects in terms of where fish are able to breed as well as be caught in the river. So Melissa, do you want to speak to some of the impacts you've seen in Cambodia?

Melissa Marschke:

Yeah, sure. So I've been working right near the Thai border for I guess, over two decades now, and they're typically fishing villages that only have boat access. And so they're what was at least at one point, considered very remote. Slowly the villages have become more connected to the state, but still are mainly by boat access. And people were mostly doing crab fishing either with gillnets or with traps in the mangrove estuary areas. Once in a while, if someone could afford a trawl, they might get a pair of trawl and go within two or three kilometres of shore and catch slightly larger fish like grouper or something. And so when the sand mining began in late 2007, one of the first things the villagers noticed was the noise of the pumping. They could hear it from the village, well, various villages because it's a roving kind



of thing, but on and off they could hear it near the village and that the fish were just gone in those areas.

And so they began to figure out certain species were really affected by the noise and they didn't see them anymore. And they would have to fish 10 kilometres further afield, which doesn't maybe sound like a lot, but if you're a fisher and you are having a 10 horsepower boat, it's really far. And the further you go away from shore and the estuaries, the wavier it gets, so the risk really increases and the longer you have to be away. So it really affected people's fishing.

And while people adapted by moving fishing grounds, et cetera, they also protested in pure frustration because this was taking place in and around a protected area, a site where there's been a lot of local resource management and really strong emphasis on people taking care of their environment and a really beautifully protected mangrove ecosystem in particular. And so there was also some erosion happening and mangroves falling into the water, but this just continued unabated for years. And so people had a choice. If they were to stay, they had to find a work around. So you either tried to have a secondary business or maybe you'd have a child that would go into the city and leave the village, but go onto land and do something else and send money back or you had to leave.

Peter Clarke:

Vanessa, I know I'm probably being a bit silly here, but I'm hearing these descriptions and I'm imagining those remote villages, once remote villages that Melissa just described. I'm assuming, this is a sort of an informal confrontation in a sense, the sand miners turn up, there is no money or benefit flowing to those local communities from the sand mining. Nothing as laughable as a set of royalties or something that might benefit those communities from sand mining.

Vanessa Lamb:

So that's a really good question. I think it's not clear. I found it really difficult just even to trace, for instance, you're extracting sand from one specific site along the Salween River around Pa-an, one of the areas that I've visited. And where does that sand go? Who takes it? Who benefits from that? Either monetarily or within their networks. And I think it's very diverse. So I actually think in Myanmar, with the rise of a real boom in road construction and a real boom in development of provincial areas like Pa-an, which have been really overlooked by the state in terms of developing them or even providing infrastructure at all, it's been decades of ignoring these areas and so it is a bit contradictory in the sense that this boom in sand for export is also accompanied by a boom in construction locally. So I do think it's a bit complicated.

If you think of a road or a new factory or government buildings being built in your provincial town, those might be benefits to you as a resident. But I think the larger scale and scope of extraction going to Singapore definitely



doesn't feel to most people like that's fair. And who benefits from that in terms of the networks of traders that have to get it to the port to have it be shipped. That's very, let's say, messy or unclear. A colleague of mine wrote about this several years ago, there being a lack of receipts of where the sand goes and who benefits from it.

Peter Clarke: Melissa, echoing in my mind as I'm listening to Vanessa is some of the things that have happened to our near neighbour, Papua New Guinea with vast different sort of mining, not sand mining of course, and destruction of rivers and vegetable gardens, et cetera. Within those villages you describe, what is the sense of ownership of the environment and the sand and the locality and are there permits involved? Do the sand runners just rock up in their barges and start scooping up sand? What are the underlying mechanisms of ownership and permits and dare I say again, royalties?

Melissa Marschke: Well in Cambodia permits are very murky. It's really hard. There's nothing online that you can do to actually follow in terms of who has access to what. We do know that in the coast, which is the villages I've been working in are really different then the river, the river areas. But the coast, from what we understood, there was two main permit holders and they were allowed to export a limited amount a year. And the argument that was consistently told, if anyone questioned the amounts was like, "Oh, this is within what we have a permit for." And so this sort of 80 million metric tonnes over a decade disappeared essentially to Singapore. And we know most of it came from coastal Cambodia in these areas because this was the area where the most amount of sand mining was going on.

So there are permits, but is it monitored or policed? No. Are the transactions, is there any paper to follow? No. It's a whole shadow network. But I think the thing that I really struggled with in the case of these villages at least, is that there weren't the secondary benefits. You couldn't at least say, "Well, at least people are working on the barges," because this isn't really a labour intensive thing, at least in Cambodia. In a place like Cambodia, no. There's dredgers and you need a boat driver, you need someone to actually operate the dredge, you need someone to then pump the sand from one place to the next, but it's not very labour intensive. Maybe a handful of villagers were able to access those jobs somehow. There was some rumours. I think people downstream for sure, a few people were accessing jobs. But it wasn't actually benefiting the local area and you didn't see the actual town where people could boat into build up much in that time period at all.

And so I think that was really a case of sand going elsewhere for the construction industry in Singapore. But I think the river sand for sure that you see in and around Phnom Penh has absolutely fueled the construction boom and many people have benefited indirectly, even as you see the river bed folding in and other people losing out in terms of their livelihoods. It's a



complex mess. I think more challenges will come as Phnom Penh's wetlands have been infilled because this was a natural sewage system and as all the wetlands are being filled in, I think Phnom Penh will have a massive sewage problem because they haven't made a backup plan for this. So there's lots of challenges yet to come.

Vanessa Lamb: Yeah. I think one of the issues that is clear is that the impacts and the benefits are really uneven. When we're talking about sites of extraction, demand, export, we can see that the benefits and the impacts don't really seem to be on the same sides of this picture. We haven't really seen, for instance, local insights of extraction necessarily benefiting economically what the benefits and where they accrue, I mean it is, as we talked about, lack of receipts a bit murky, but they're not accruing in the same places for those same people that are being impacted and I think that's a big part of the story. Whether it's China or Indonesia and whether it's domestically or for export. This unevenness, I think it deserves more attention.

Peter Clarke: In these livelihoods that you've both described as being constrained by sand mining, what patterns of labour migration are we then seeing say in the villages that Melissa was talking about or other parts of of Asia? Are we seeing a clear pattern of people having to leave their native environment and go to bigger cities or to work in places like Singapore?

Melissa Marschke: Yeah, people absolutely have to leave, but it's not just because of sand mining. There's so much going on in the region and so many drivers out of villages because life there is precarious and tough and there's not a lot of options as resources decline and sand mining further compounds that. So you have that from rural spaces and so people might be moving into a provincial capital or the capital nationally. So Phnom Penh for example.

Vanessa Lamb: Yeah. And with that you have communities at least along the Salween, some of them are mostly older people and then young children. And most people who are in the middle, prime working area have migrated abroad to Thailand actually. And so it's an ongoing process. But that's definitely been exacerbated by things like this kind of extraction, which makes, as you said, more constraints on already potentially limited ability to make a living. And I think on top of that you've also seen this boom in urbanisation, which I know in some ways can have benefits, but I think at least in Myanmar there's been some benefits that go to rural communities and some investment in rural agriculture. But it's not at the scope or scale as you've seen in cities or secondary cities. And so you also have just a lack of state support in rural areas to make a living as well.

Peter Clarke: Let's finish our conversation with the environmental aspects and those dimensions about the environment. I think most people, the average person in the street would think of sand as a metaphor for endlessness. That it's just in great supply all around us. But of course that's not true. And it's



intrinsically unsustainable, this mining, isn't it? It can't go on forever. It is a nonrenewable resource, sand. Melissa?

Melissa Marschke: Absolutely. Absolutely. Sand scarcity is real. It's the environmental crisis we haven't been thinking about. We are extracting more sand than is being replenished. A crisis will emerge and it's something we have to deeply think about. We have to build our cities differently. We have to use less sand, we have to be more creative with our R and D and more than that, we have to think about the downstream impacts of the sand industry. Cement industry is so bad in terms of climate impacts and so we have to really start thinking about that as well.

Peter Clarke: Vanessa.

Vanessa Lamb: Two things I just want to add. One is I think one of the issues that maybe gets overlooked in this conversation about sand scarcity and sand crisis and sand as a commodity that's being traded is that for a long time, sand has also been seen to have other values by other people as we mentioned in terms of ecosystems, in terms of livelihoods, whether it's fishing or agriculture. And I feel like those kind of values and really longterm uses of sand that aren't as unsustainable let's say, have been kind of overlooked in this narrative. So I feel like there's something about maybe disentangling the use of sand as an overall terrible destructive thing, unsustainable use of a nonrenewable resource to kind of thinking about and teasing out some of these differences which are really important and really understanding some of the broader values that sand isn't just used for concrete for instance or fill.

The other thing I just want to say is that some colleagues recently have called on the UNEP and the World Trade Organisation to come up with a programme to monitor global sand resources, which I think is a really interesting proposition, which also comes with a whole host of challenges that we mentioned in terms of documentation and these values and how they would be included. But I think it's really a pressing issue and I think it's something that at the very least is kind of sparking debate of this. An issue that's maybe banal right? We use concrete or we depend on it every day, but most people don't really think about its source or the impacts of sourcing that to build our cities.

Peter Clarke: It's almost paradoxical in a way. We see so much sand around us, but with the actual scale of sand mining as we've been discussing today is almost veiled from us. It's hidden from us. Melissa, you described earlier those reactions say in Indonesia on an environmental basis, the loss of those islands, et cetera, but politically and socially even, in some of those polities we've got a lot of cronyism, corruption, straight corruption, patronage, so the regulatory environments, the frameworks there to bring more structure



and framework to regulating the environmental impacts, that's pretty impoverished.

Melissa Marschke: It's a big challenge. Sand governance needs to move forward. I'm delighted that the UN has put that piece on the agenda, but I would say sand governance is an issue everywhere. We're seeing examples throughout North America have fights over beaches, people stealing from one section of coast to replenish a beach on another section of coast. So I think it's going to be a challenge globally, not just in places that are more impoverished. If anything, these places are at the forefront of feeling the impacts of not just sand mining but also construction. And how do people continue to sustain a livelihood in rural areas? Urban heat that emerges in these constructed environments. You know, maybe there'll be at the forefront of also finding solutions, particularly if there's more money put into research and development for example.

Peter Clarke: Vanessa and Melissa in Canada, thanks so much for being with us today on Ear to Asia.

Melissa Marschke: Thank you.

Vanessa Lamb: Thanks Peter.

Peter Clarke: Our guests this time have been the University of Melbourne's Dr. Vanessa Lamb and Associate Professor Melissa Marschke from the University of Ottawa in Canada. Ear to Asia is brought to you by Asia Institute of the University of Melbourne, Australia. You can find more information about this and all our other episodes at the Asia Institute website. Be sure to keep up with every episode of Ear to Asia by following us on the Apple Podcast app, Stitcher, Spotify, or SoundCloud. If you like the show, please rate and review it on Apple Podcast. Every positive review helps new listeners find the show. And of course, let your friends know about us on social media. This episode was recorded on the 24th of February, 2020. Producers were Kelvin Param and Eric van Bemmell of profactual.com. Ear to Asia is licensed under Creative Commons, copyright 2020, the University of Melbourne. I'm Peter Clarke. Thanks for your company.