# **Student Sustainability Research Conference 2021**

The Climate Press presents

**“Local experiences of climate change adaptation”**

**Paloma**

You are listening to The Climate Press. A podcast where we aim to bring together climate science with public understanding and action. Today on the show we're joined by Professor James Ford, Priestley Chair of climate adaptation from the University of Leeds, and Professor Petra Tschakert, Centenary Professor in rural development from the University of Western Australia, and she is in Leeds at the moment because she won the 2019 Piers Sellers Prize. Thanks for joining us today.

**Petra**

Thanks for having us.

**Bianca**

In some of our previous episodes on the show. We've talked a bit about the human impact of climate change. So for example, the potential increasing inequalities with 1.5 degrees of warming. And so today we want to learn a little bit more about how climate change is actually being experienced on a local level. And perhaps you could both help us understand a bit more. So maybe starting off with a bit about your research, and what you're doing with communities, how you're working with communities, and why this is important for improving our understanding of climate change.

**Petra**

Well, first of all thanks for the opportunity this is indeed exciting and I think you are doing a fabulous job here with your podcast. My work has been predominantly in rural areas, hence my title professor in rural development, and almost exclusively in the context of development. So I have worked in West Africa for 20 years, predominantly Senegal and Ghana, but also for a little while in the Himalayas - a project on climate change adaptation in North East, India, Assam, and Nepal - and only more recently, since I moved to Australia four years ago, have I had an opportunity to start working with people, community members, in Western Australia - largely in a rural perspective but also rural, urban, comparison. So, community level work, definitely place-based adaptation, trying to understand what rural people, mostly farmers and systems farmers, men and women, do to act against the changes they are observing. I think it's important to stress that it's often very difficult for people at the community who have not had the privilege to go to school to have access to climate change information to even understand what the differences between climate variability and climate change. You have to imagine, Senegal also the northern part of Ghana, it's, by definition, a semi arid climate and climate uncertainty and variation from year to year, will there be enough rain to plant crops or not, is part of the normal. So for people it's really hard to understand the difference between variability and change. But, you know, one example that comes to mind when people observe climate change is, I remember distinctly this one older farmer telling me that, in addition to the fact that it is increasingly difficult to now predict when the rainy season starts and when they should sow their crops and if the first rain is good enough or not. He said the most striking example is actually in terms of temperature rise, and it's winter temperature. And it's night temperature. And I hadn't thought about that. He said before, he always used to be a smoker, he said before, when we smoked at Christmas time, we had to step outside and it was so cold that our hands would shake. Now, we don't even need a jacket to step out and smoke. So people observe. So most of my research has been on what is it that people observe, what is it they do about it, and they have a lot of strategies and we can come back to that. But more importantly, what is it that we researchers can do to help people who don't have access to the knowledge to interpret climate information to anticipate what the climate could be? How the rainy season could be the following year, over the next 10 years? And how we can collectively engage in what we call anticipatory learning, how to learn about a future that we really don't know. How to take on uncertainty and develop a couple of strategies, and to ensure that the strategies that people, at a community level, take on don't just benefit the most powerful and most affluent members of the community. So that's roughly what my space has been. I'll let James continue and then we can come back to what adaptation may actually mean to us.

**James**

Petra and I have a lot of overlaps in terms of the research that we do and you know I'm doing very very similar work to what you're doing, West Africa but in the Arctic - a location where in the summertime temperatures will be around 10 degrees Celsius and in the winter minus 30, minus 40 is quite common. I'd been working with mostly with Inuit communities across northern Canada and also in Greenland, since the early 2000s. And really one of the main focuses of my work is what changes are people seeing in their environments. One of the reasons we work in the Arctic is because it is the region where we're seeing the strongest climate change signal globally. You know, we hear talk of 1.5-2 degrees Celsius, well that has already happened in the Arctic over the last 20 years. In some areas where I work we're seeing four or five degrees Celsius warming already. There's a wide variety of impacts and you know the story that Petra told, I have heard very similar stories in the Arctic around sea ice. So in one of the communities where I work, Iqaluit in Nunavut, there, you know, back 20 or 30 years ago, around Halloween, people were able to use their snow machines on the ice. Today, that's no longer possible. The ice doesn't form really until Christmas time now. And so those changes are really noticeable, especially around sea ice, but also more variability, more variable weather conditions, more open waters in the summertime, more dynamic ice, a lot of the work that myself and my team does really, really tries to say, what makes communities, including individuals or households, vulnerable to those changes, how to they experience them in their daily lives, how do they cope with those changes, what techniques do they use, how successful are they, what are some of the equity implications in terms of adaptations, is everyone able to adapt? What we find is that communities are very very resilient in many ways, and suddenly, people are adapting to change by altering what they hunt, what they fish, when they have to fish, and how they use the environment. This comes as no surprise, these communities have lived in the Arctic for 1000s of years, and lived through past episodes of change. What we can really focus on though is that there are differential vulnerabilities. And so those individuals who have access to financial resources, who have money, can buy boats with more open water in the summertime, they can travel further distances to access hunting areas, by detouring areas and avoiding danger on the ice. But for those households that don't have access to income, which is the majority really, they can't afford boats, they can't afford the extra gas that it takes to go out. So we started to see some of the differential impacts of climate change. There's also knowledge systems. Inuit knowledge is very very important in adapting to change. Knowledge of how to forecast the weather. Knowledge of how to use the land. Survival skills. Knowledge of what to do if you encounter danger. Knowledge, which is even more important now with climate change. What we're seeing there is those knowledge transmission networks are being disrupted. No longer are the younger generations learning this knowledge. So the climate is changing, it's becoming more dangerous to engage in the environment, but people don't know what to do. Petra's work really speaks to this as well, it's not just about climate change, it's about societal and cultural change acting at the same time, coming together and, in many cases, accelerating the impacts that climate change is having, but also differentiating those impacts. And one of the reasons that we're seeing this kind of breakdown in knowledge transfer has a long history. It goes back to the resettlement of Inuit communities in the 1960s, in many cases, forced by the federal government as part of their attempt to colonize the Arctic. And the legacy of that is still felt today. So a key part of my work is trying to tease out those linkages, those pathways, through which climate change plays out locally, but also those social and cultural and economic factors which affect how it is experienced.

**Bianca**

You both mentioned equity and equality in these strategies, adaptation, prevent and vulnerability... and it sounds as though existing inequalities already are now being amplified within these communities. In what ways do your work really focus on that and looks at that, across communities even within communities?

**Petra**

Yes, I think James is very right, our focus on inequality and differential vulnerability is at the core of what we do. Maybe before responding directly to your question, Bianca, let me just clarify how we understand vulnerability in the context of climate change. So, there are various definitions of vulnerability and adaptation and adaptive capacity and sometimes they can be confusing. I like to think about vulnerability as one driver of risk that people experience when it comes to climate change, then the other two drivers are: One the climate hazard itself - increased temperature, excessive rainfall events that result in flooding, drought, heat waves, these are all climate stressors. The third one is exposure. Well if you think about floods, and to think about where people live, well if they live in the floodplain, they're directly exposed to a flood. Vulnerability exists often independent of a climate hazard, it’s vulnerability baked into society. It's a propensity and predisposition to be harmed. So if you think about the heatwave that is now just developing over Europe and who are the people who are going to be most vulnerable, everybody of course is exposed to the heatwave, everybody who is living in Madrid or in Paris right now they're all there. But those who are most vulnerable are going to be the elderly. Many of them have a predisposition whilst their age (e.g. medical conditions); the children; but also people for example who are homeless, who don't have anywhere to go, who don't have a place that has air conditioning. So vulnerability exists in society and inequalities -entrenched inequalities- that are there, independent of the climate hazard, and entrenched poverty will make it much more difficult for certain segments of society, to act. So it's not that people act, we do not act out of ignorance, it's because they don't have the means. So understanding vulnerability is really important.

One example coming back to my work in West Africa,that may not seem that obvious on the surface, but nonetheless, actually further entrenches and perpetuates vulnerability and unequal responsibility, unequal possibility and capacity to react, is based on gender differences within the household. For example, in many places in West Africa, there are clear “male crops” and these are often the crops that bring income. These are “cash crops”, often in West Africa it's maize, sometimes it's wheat, sometimes it's millet... So these are the crops that men are responsible for in the male fields and the harvest that goes to the market and brings income for a family. Often the male was responsible for that job and the money. And then their female crops. These are usually planted on smaller plots, for example cowpeas. Now, even though the intention certainly was good, it failed, and it perpetuates inequality and the intention is to introduce crop insurance for farmers. Well the science was only good enough for the major crops to calculate potential damage, either due to rain or excessive temperatures, and only the man, the males the male farmers could actually sign up for crop insurance, because he knows their crops for which the scientists had produced adequate information, they would get compensation for damage to their crops. Sadly the science didn't find it important enough to develop a similar metric for female crops - the women's crops - cowpeas. And so the intention to enhance adaptation backfired and benefited the men, instead of the women. So this is perpetuating existing vulnerabilities, and this of course hurts us right so how can we ensure that a) we understand what are the women's crops, what are the men crops, ensure that the same information is available to all crops. And if that is not possible, find other mechanisms, for example, better forecasts that people can use independent of the cropping system. And so that's just a tiny little example but I think it shows how, at a very small scale, different vulnerability and inequality exists.

**Paloma**

So, the risk is the same for everyone, but then different factors exacerbate the threat to a certain climate hazard?

**Petra**

So I would slightly reframe that and the IPCC has a wonderful graphic we call it the “propellant graphic” that shows that. So think about three dimensions of risks. The hazard exposure and vulnerability. So if the hazard (drought) is the same, and exposure is the same, because everybody lives in that area, but vulnerability is different, then you will have differential risk, and you will have unequal or uneven impact when everything unfolds. So, differential vulnerability often drives differential risk.

**Paloma**

I was also wondering how do you know about these male and female crops, is it some issues that they (the farmers) raised or how do they communicate? Was an idea from the people from West Africa to show this problem, or was it someone that came from another place that reported that?

**Petra**

Well I think this is precisely why people like James and me work at the community level, you don't get this information in national reports on climate change, you don't get this information in climate models, you don't see it in any kind of statistic potentially available through the governmental climate change portal. You have to be at the community level, you have to talk you have to be able to listen to people's stories. And, you know, not always, our stories are “the absolute truth”, but we listen to many stories. And if we hear the same message over and over again, which we call “triangulation” in our data set, then we feel pretty confident that what we hear is actually what is happening But it takes time, it takes effort, it takes also I would say a certain level of skill to engage with people who have been, whether through colonialism, or other mechanisms of discrimination and disenfranchisement, have been continuously silenced; who have been continuously told that what they know is irrelevant, and backwards, and actually in complete opposition to modern science. So a lot of what we do, is we build trust. And this is what we then call “collective learning”, we try to learn from each other. So never ever do we walk into a community and present ourselves as the scientists who have the ultimate answer, never ever do we present ourselves to say “look, this is what we know and this is what you ought to do”. It is always a conversation, it's always a debate. We're willing to listen to all kinds of perspectives.

In the context I've worked in very often it is- and that includes work in northeastern India (some), but also West Africa and I've worked in places in eastern Africa as well - Very often it is the established elites who will talk first. It's the man who will talk first the women sit back, So we have to develop methodologies, methods, ways to communicate with everybody, to hear everybody's voice, and, and think about strategies, methods, ways of engaging that allow to envision futures, where those who already hurt, will not hurt, will not be hurt again in the future. So, this is what we mean with equity on the ground so we cannot think about solutions that only benefits the richest and the most powerful, that would be perpetuating inequality.

**James**

I think that the point about trust is really important. Community based research it really does depend on trust. There is a paper from about six years ago called “I spent the first year drinking tea”, by Heather Castleden in Canada. And she talks about how it does take a long time of just having tea, coffee, meeting people, hanging out, being in communities to build trust and not just to build trust but to understand communities, how they operate and how they work. And without that trust you're not going to do good ethical research.

As I said, in the work that my team has been doing we try to work with just a small number of communities, try and build that trust over long periods of time to really start to develop collaborations.

Also your point of vulnerability I think is also key. A famous social scientists - I forget who it was - said “vulnerability doesn't fall from the sky”.

**Petra**

Jesse Ribot. We read the same literature.

**James**

Yeah, there is a whole bunch of social, cultural, economic processes at work, often with very, very long histories and researches about trying to trace those various non climatic factors and how they create vulnerability. Yet, the mainstream research and climate change science still doesn't get it. You'll get a lot of work on climate change vulnerability, and how the media presents it, - which is always the risk- is related directly to the climatic events. We talked about the heat wave in France: the main focus is the fact that it's 45 degrees Celsius. If we look at flooding events, we focus on the magnitude of the flood. Very rarely do we seek to understand those underlying drivers, and if we don't do that, we don't address those adaptations in many cases, then they will perpetuate the factors that created vulnerability in the first place.

Thinking of some of the example of some of the gendered inequalities, it's a really good example of that. There's other examples in the Arctic that I could also use, of adaptations that develop in a lack of a real understanding of how things work on the ground. So one example would be: a lot of people are talking about increasing use of technology to adapt to climate change, using GPS, VHF radios, and satellite phones to help build safety for people using Arctic trails. We know it's important. But one of the concerns we have is that those technologies allow people to use those trails, without having a fundamental knowledge of safety considerations. So GPS works well until the GPS breaks down or freezes or you lose it. And if you don’t have those traditional navigation skills, you get challenges... or even your GPS might take you over some area of thin ice. Unless you know those trail conditions you might not know what thin ice looks like. So those technologies, adopted in isolation of some of the fundamental knowledge, contribute to what we call “maladaptive” responses, and actually increase vulnerability in the long term.

**Petra**

Can I build on your example, James, from technology? I think it's really fascinating because a lot of the literature points towards the usefulness of technology and facilitating adaptation. And, you know, when we talk about adaptation, often it just means adjustments to changes, it can really be anything from building a seawall or using more drought resistant crops to early warning systems and social networks, there's a whole range of things. But speaking of technology reminds me of an example - it's not my research but it's a another geographer female geographer from Nigeria, by the name of Idowu Ajibade-, who has worked on floods in Lagos, Nigeria, and Lagos is a multi million population city and hugely complex.

**Paloma**

The population in Nigeria is expected to grow even more.

**Petra**

It already has exploded, but it's going to grow even more and it's, it's, yes it's really out of control. But Lagos also has flood early warning systems. So it is a technology that is supposed to help people understand when a flood is about to come.

Lagos had a massive rainfall in July a couple of years ago, and flood early warning was made available. However, it turns out, and this is not about gender, this is about class, class differences, certain parts of Lagos are very rich, these are the places that colonial masters occupied early on, and it’s of course one of the best places in Lagos. Lagos is constructed around a lagoon and people who lived on these particular island called Victoria Island (part of the lagoon system before) were simply displaced to other areas. The more the population grew, and the more - even after colonialism - the more affluent populations moved in, the more and more not so affluent populations were displaced.

And so now they find themselves in the most exposed areas to flooding, and these are the swampy areas, the mangrove areas... so they are hugely exposed. Flood early warning starts, while people in these particularly vulnerable exposed neighborhoods they don't want to leave their houses. Despite the early warning system. And you would think “what's wrong with them?” I mean, they get a message “you ought to leave”!. And they said :”Absolutely not”. If they leave their houses, the government will come in with bulldozers and try to evict them, because it has happened before.

So technology often is not the solution, particularly not when they're entrenched power dynamics, huge class differences between the richer and the poor segments of population. And these power battles are played out on an arena that is called flood adaptation. And often it's about trying to get rid of informal settlements or informal settlers, to get rid of populations that may seem like an eyesore, while they ought to live somewhere! They’ve been displaced and displaced and displaced.

I’m going to share another little anecdote here from the same study area is actually that Ajibade not only found that people in the poorer informal settlements, lost lives, and houses during this flood whereas, the richer people on Victoria Island did not, but also turns out that they're hugely unequal policies when it comes to help that then further result in unnecessary death. So here's the, I think a really really sad example and depressing the example that shows why uneven and anti poor policies, further exacerbate vulnerability. And here's the story. So it's this one woman who was pregnant and it was about to give birth. Just when the flood was announced, and she went to a local health clinic, and was told that, yes, she could get medical assistance to deliver the baby, but her husband would have to give donate blood for the National Blood Bank. Well, her husband and the woman herself for both Muslims and declined, has declined to give blood, because that's against his faith. And he was, well, he said, “well, I'm happy to pay” - even though they didn't really have a whole lot of money - “instead of getting blood”, but was told “No, that would defeat the purpose of the policy”. Because if everybody did that, then they wouldn't get the blood samples. So they were sent away and she didn't get the medical health that was required for delivery. Turns out that she had to give birth at home during the floods, and because it's a neighborhood an area that doesn't have any municipal health in terms of sanitation and waste, a lot of waste and garbage and urine was swept through the house and the baby died. So, this of course is sad enough in itself, but where do you think the blood samples go? Who do you think benefits from the blood that the poor, literally, through their embodied blood donate? Well it goes to rich people on Victoria Island for cancer treatment. So you have a climate hazard: flood, you have exposure that is already unjust, because people were displaced, and then you have health policies that further exacerbate the lot and the destiny of people who would need help most. And that's hugely unjust.

**James**

That's what our challenges are. We talk about adaptation (researchers and governments), the dominant paradigm is to think of things like technology, sea walls, weather forecasts, including for protection, which are of course important. But what we lack is a focus on the role of vulnerability in the sense of adaptation to really seek to go to the core of those factors creating vulnerability: the disempowerment, the marginalization, race, gender, class and so forth. And what we see as a result of those is these kind of examples. We see this with the Arctic, in Africa, in Latin America, and there's a big concern that adaptation, in many ways, can perpetuate some of these unequal power relationships if it's done in a bad way. And now we're starting to see some critical reflection on this from people like Siri Eriksen, yourself, and others are starting to say “Adaptation in many cases can increase vulnerability and make things a lot lot worse”. A concern that many of us in the social sciences have at the moment, I think.

**Petra**

And of course, we can talk about this forever, but the question is (maybe I'm stealing your thunder): how can we do it better? How can we prevent these examples to continue? And I think both James and I work along those lines, maybe in a slightly different way but my effort has been to facilitate anticipatory learning. How can we imagine trajectories in the future? - and we call this *participatory scenario building -*, how can we think about the future? not because we can predict it and not because we know, we as scientists know exactly how it's going to be, but we want to widen people's horizons and say well if the conditions are A, B and C, this is what we would do here would be our first response strategies. If the condition is different, we would have a different set of strategies. And also to identify very clearly where people's capacities would be, would reach the ceiling.

Here's an example from Assam - some ethnic minorities - and it's not about gender, it's not about class, it's about ethnicity, the missing people in Assam who originally came from the hills but settled in the floodplains. Why did they sell in the floodplains (the most flood prone area)? Well, because other areas were already occupied. But they've developed an incredibly advanced and sophisticated insight on how to navigate in the floods, their houses, they have sand banks, they know how to divert their cattle and other animals when the flood comes. But if the river exceeds its normal flood level, there's nothing people can do, they really wouldn't need a more solid embankment. So, we have developed scenarios to understand what could be done if the floods got worse, and they will get worse with snow melt in the Himalayas, the Brahmaputra delta and also more increased monsoon events as a narrative building is not something you need a computer for you don't develop scenarios like models. We create storylines about the future, and every community has a community artist. So we then make drawings of these storylines and in various settings we have then acted out these storylines to showcase and sometimes it's fun, sometimes it's sad to play what a particular scenario would mean for everybody in the community. And there's an incredible wealth of information in there. And it's sometimes hard to inspire people to think about the future which they believe they don't own, often it's the understanding that it's God or Allah, or whoever else and creates the world that is in charge of the weather that owns the future. But this is how, this is why creative methodologies are important. So we help people to think about the future, even though we can predict it, and to deliberate and negotiate: who would do what, and when?, and how? And would whatever one person does exacerbates the destiny of other people. Would that be fair at the community level?. And I think there's a lot a lot of hope in these participatory scenario building activities, we can overlay them with the best climate inflammation we have, to even further to expand people's horizon about what the future could bring, but also understanding where people's limits would be reached, and then negotiate with emergency managers at the district level, at the regional level and say “at what point would additional help be needed, and at what point, our emergency managers and NGOs and whoever works in these rural settings, at what point is there help needed? and how can emergency management leaders, how can they guarantee that help will come in those difficult times?”.

So this is adaptation, not as a one time solution like “this is the magic school and this is what would help in all situations”, but it's to understand how diverse the future could be, what could be done locally who could do what without exacerbating negative impacts and what point, and who, would provide assistance, I think it's fundamental. And this is something we have done, and I think there's a lot of hope in that. I'm sure you have a good example...

**James**

What really differentiates this kind of approach is: we're starting with impacted people on vulnerable people, the disempowered first. Whe are not doing climate modelling or impact modelling and then going to communities and saying: “what does this mean for you?”. It’s about talking to those communities and saying, “what's important to your lives today?”. “What factors create your vulnerability to these conditions?”, “how might your future look?”, “what kind of future do you want and how are you going to get there?”. An then “how does climate change come into that”? The key thing is starting with the people themselves. That’s what differentiates what we are talking about here, compared to mainstream approaches.

**Paloma**

Is this a priority of local governments, or this is our priority for first world countries? So is adaptation in the agenda of the local governments?

**James**

I can talk about the Arctic, where it certainly is, because we're seeing such rapid climate change. It's very visible and so we're seeing, you know, communities saying “there’s something going on here”. And now it's quite obvious what's going on. And so we've got a lot of local and regional governments across northern Canada saying “we need to adapt, we need to do something to respond to these changes we're seeing”. Adaptation plans are being developed at the community level, we're seeing territories developing adaptation programs. We're seeing a lot of leadership actually coming from the ground up. In terms of, you know, communities themselves saying, “this is the kind of science we need” scientist going to communities and communities. We are seeing across Canada, even the federal government putting funds into communities to help them start to prepare for climate change impacts. It depends on where you are. So places like Greenland and Russia are not quite as advanced in terms of climate change in those kinds of ways but in northern Canada we see a lot of leadership and they have been very forceful, very very active in the global arena, you know, situating climate change as an issue of human rights. Climate change is, you know, is an additional stress all Inuits communities face, and is further challenging their ability to practice their livelihoods. Inuit are very active in the UN climate change conferences, advocating, saying “we need help to adapt”. “It is an issue of human rights and we also need mitigation”. We need to meet the 1.5 degrees goal to reduce our emissions globally.

**Petra**

You know I can speak for many African countries here, but I can also make a comment on Australia. So for many of the African countries I've worked in: Senegal, Ghana, but also Tanzania, a little bit South Africa, adaptation is absolutely fundamental. It is written into National Climate Change Response Plans. It is written into the NAPA (National Adaptation Programme of Action) and across Africa countries have developed their own NAPAs. Adaptation for many countries that I work with is not just about technical solutions, it's also about receiving adaptation, money, funds, from countries in the global North, who are predominantly responsible for the changes we see today, so adaptation is fundamental.

I think where it’s a little bit more difficult, as well, is what does adaptation actually mean at the district level. So for Ghana, for example, I know that every single district has a mandate to include climate change adaptation into their 5 or 10 year district level planning. For many it is, however, a mystery really, how to do that in the absence of good, detailed regional climate projections. It's hard to really determine what the strategy should be. And in the absence of good data, also often in the absence of a dense meteorological network, district level managers will just fall back to kind of what we already do: building another embankment here, doing more drought resistant crops there. There's probably less understanding about adaptation as -something that James and I would call is probably more important- is adaptive decision making, how do we make decisions together to respond to events that we often cannot predict for a particular season, or for a particular year, but we know these events will increase in frequency and intensity?. So how to do this adaptive decision making, year by year is much more difficult than I think. I mean, all district level, agricultural managers, emergency disaster managers... have always had a huge desire to work with us because often it is true that we have access to the best climate information that we can get.

I also know that in Australia, which of course is a very different context when it comes to financial resources, adaptation is also absolutely important and Australia has a very devastating history, millennium drought, the beginning of the 21st century went on for 10 years, coupled with horrific bushfires, but also has a history of very devastating floods, particularly in the eastern part of the country, so adaptation there is paramount as well. But what we observe is that there's often a disconnect between state level or national adaptation plans that are written based on climate models, written in offices that are far away from where people live and where people have to deal with the consequences. And we find that these adaptation plans are often out of touch with what people care about, value in their daily lives, and want to protect. So most of the work I'm doing now in Australia, starts with, you know, similar to what you have set as well. What is it that people value in their daily lives?. What is it they would absolutely want to protect?. And what is it they would potentially, let go off and sacrifice?. So to understand value based adaptation and how people make trade offs between the many things they value, I think is really the frontier of research, and I'm excited to do more about that.

**James**

I think that there is a lot we can learn here from the Arctic. The governments of Nunavut, it was way back in 2011, developed its own kind of adaptation plan. It was more like a strategic document, than a plan per se, but it was based on Inuit cultural values. So instead of starting with the science, they started with the communities themselves and said “what do you want our adaptation plan to look like” and communities said: it is about Inuit values, it is about Inuit knowledge. And that was the starting point. Then [Western] science was brought into that. But again, it is this people centered approach, which I think is key. I think northern Canada has actually taken a leadership role in promoting that at the policy level. Globally, what we can do globally, I think, with these different experiences around adaptation research.

**Paloma**

For example, in the Inuit community, if some families can't afford to buy new technology or basically to adapt and they have to move to the inner continent or to another country, how easy might it be for them - as kind of climate refugees - to start a new life?

**James**

We don't really see that in the Arctic. There has always been concern that climate change might increase migration from some of the smaller communities to regional centers. And there is some migration going on from the smaller communities to regional centers but the work that has been done has not been able to detect a climate change impact on that. Whether that happens in the future or not, we don't know. Because communities are very very strong support networks; there are very strong cultural support networks in communities; communities look after each other, you know, social networks are really strong so people share, share food. If I can't afford to go hunting, often what will happen is, my family members, my friends, if they have access, they'll share their food with me. People share equipment. If I've got a boat and you haven't, I often will share my boat with other people. Sharing of knowledge, as well, is also very very important. So, these kind of strong community bonds keep people living in those communities, because if you leave to a more regional center, ones where you have to fly to, it's really, really expensive. So if you're moving, you are kind of moving for good. It’s gonna be hard to go back to your community. And you’re moving away from your small communities, which have pretty strong cultural values and bonds, to larger communities, which still have that, but they are larger communities. So, as yet, we've not really seen this kind of climate migration really happening in Arctic communities. In North America, there's not been too much work done on this as say Greenland or Russia, but there has been some work done in Alaska and Canada, which has not shown any impacts so far.

**Petra**

So I can provide two examples, one quickly from Ghana. So often what we see is people moving, or migrating, but not to a different country, but within the same country. Exactly, to the city or to seek work, for example. So, Northern Ghana, similar to Senegal, is fairly dry - whereas the southern part is more subhumid, there's more agriculture, cities are more flourishing, you know, there are more possibilities to find work. So what we have seen in the north part of Ghana is that what we call able bodied people, so usually younger male and female community members, maybe between the age of 17 and 50, move to the cities, either to seek seasonal work or to seek permanent work, and then send money home to the communities. It's called remittances, but it's within the same country. What that of course means for people who stay behind, is not only that, they the elderly, the sick, the disabled, and the children have to face the more, the more devastating the longer the more difficult droughts, they also feel the social degradation and the social erosion of the social networks because half of the community is now in the city. And in those cases, we cannot really talk about climate refugees, but the impact of migration within a country is then felt kind of as a ‘double whammy’. Both the climate desiccation - the drying - but also social desiccation of the drying of social networks. And I think this is what's hard for people.

I have this reminiscence of one interviewee who said it is older men, elderly men...and they try everything that they can - I think you're right, people often are very resilient, resistant, creative in what they do - but this old man said “you know it's really hard now because our water has dried up, our sons and daughters are far away and yes they do send money, but nonetheless, it's hard for us to be here” and he said “the most difficult part, and maybe the most horrific part, is that now we - the people in the community - now, we have to share the same water source with our animals”. And he says, “this makes us no longer human”. So it's not an impact of losing your house in a flood or your material destruction. It's losing your dignity as a human, and that's really hard.

Where I think the issue of climate refugees is much more acute, is in small low-lying states, island developing states. Personally, I don't work in those contexts and I think you don’t either, but we have colleagues who do - Jon Barnett, University of Melbourne, is one example. And he says, you know it's difficult for people here and it's difficult for political leaders on what to recommend to their citizens. And he uses the example of Kiribati and Tuvalu, and both are acutely threatened by climate change, sea level rise, storm surges, intrusion of saltwater. So this is not in 100 years from now, it's happening now. And, and it's difficult for political leaders. The president of Kiribati has adopted a policy of migration in dignity, encouraging people to move. Kiribati bought land in [Fiji] so people can resettle. And he thinks it's his responsibility to ensure that people *can* move before it's too late. And, of course, leaving your homeland is never easy. It's not only that you give up your your physical home, but you also give up a lot of your social network, your culture, your language, your identity, all of that. But he thinks it's his responsibility to ensure that migration can happen in dignity. The president of Tuvalu says: absolutely not. “We are not going to move, we're doing everything we can to enhance adaptation. We will stay where we are, because this is our home, and without our home we are nothing.” Now think about if the two of you had to make a decision, as political leaders, for your countries. It's a hugely problematic and difficult ethical decision. Do you want to encourage your people to move? And, by doing that, essentially force them to give up their home as they know it. Or do you want to encourage people to stay? And, hands take the risk of NOT being able to continue their livelihoods where they are, and it may then be potentially too late. So I have enormous respect and admiration for political leaders who, very very very thoroughly, think about their ethical obligation to make decisions in what's rightfully now called: climate emergencies.

**James**

I have some examples from the Arctic, including those from Alaska, where we have communities like Shishmaref and Kivalina. These are communities that are experiencing the adverse effects of climate change. Current projections suggest that those communities may not be there in 20 years time. A number of communities have actually decided that they want to leave. As Petra said: migration in dignity. They weren’t going to leave their communities to collapse into the sea, but then have to leave and go anywhere. They've actually identified locations near to their communities where they can move to and maintain their livelihoods, maintain their culture, maintain their values. The problem is the federal government in the US has not provided funding to do this. Moving communities is not cheap either, we’re talking hundreds of millions of dollars, in this case. So while communities have decided to leave, they aren’t able to. So, it's a big challenge. What do you do? Do you invest in your community - that’s not going to be there in 20 years time, that you want to leave? So while communities here are trying to migrate in dignity, they have been prevented from doing so in many ways. That uncertainty really plays on people, and obviously has mental health implications as well.

**Petra**

I just happen to know that for Alaska, it's not just about moving from place A to place B, of course, you know it's about the ancestors. It's about where they are buried, and whether or not where they are buried now is actually already affected by erosion or, in the case of small island states, by sea level rise. So it's not just about the people today, it's about the generational impact. For those who are no longer with us, but whose spirits are still there, to ,of course, the future generations of those who are not even yet born, and our responsibility to make decisions to the past and to the future. And these are difficult decisions. And there is really, I cannot think of one single case where there's a win win. It's always a difficult trade off, and that's why I think it's even more important to understand that adaptation is not just about finding the “perfect solution”. It's about deliberation. It's about discussing. It's about negotiating and understanding what trade offs are absolutely necessary and where there is some wiggle room, and what is it that that we ultimately, all of us, will have to let go of. There's one, and I’m really, really excited about this, we have started a new research “stream”, if you want, which we call the ‘social science of loss’ that deals exactly with those questions and knowing that adaptation will not be possible for everybody and everywhere. And I think all of us have to start thinking very carefully about what is it that we absolutely need and want in our lives? And where is it that we can easily make sacrifices? And what is it we will defend you know until we die?

**Bianca**

How individual that is though, because even the examples that you're giving, it's like, even within communities, within people who you might expect to make similar decisions, it can be quite variable: who wants to stay and who wants to go.

**Petra**

Absolutely.

**James**

Communities are never homogeneous. Communities are full of individuals and different power groupings, and disenfranchised, and marginalized. That’s one of the big critiques of some of the work that social scientists do is that we do treat communities as a sort of homogenous groups, or homogenous entities, which they are very often not.

**Bianca**

We've heard a bit about how your work and role as scientists is really taking these stories and these truths from the local level and connecting them with decision makers outside of the communities as well. And how does this kind of translate from national to regional levels and perhaps playing out on one of these more international global scales of say the Intergovernmental Panel on Climate Change?

**Petra**

Sure. So both James and I have had the pleasure, fortune / misfortune (laughter), to work on the Intergovernmental Panel on Climate Change - the IPCC. It's an incredible experience and I think we definitely need more social scientists and people from the humanities to participate in such massive undertakings. What the IPCC does is to synthesize available literature. So it's not to conduct their own research. It's to go and see what is written and published in the literature, and then summarize all that insight and write it up in chapters or summaries for policymakers. And so our job is to, of course, publish the work that we have done in our various community settings, and ensure that they are well represented in good journals that then are reviewed in the process of the IPCC. So, I have worked on the fifth assessment report. And on the special report for 1.5 (degrees C), and already in the fifth assessment report, we were encouraged, not only to look at evidence in peer reviewed publications - the journals - so our academic output, but also in what is called the ‘grey literature’. That includes, for example, reports by NGOs, for example, Oxfam or CARE International or the Red Cross Climate Center - not peer reviewed but nonetheless these organizations that work on the ground with people on adaptation, and certainly there's a lot of insight that comes out of those reports. So we were clearly encouraged to use such great literature, also literature that is not always in English. So if we had publications that came, for example, out of Latin America and or in Spanish we were absolutely encouraged to use them - as long as we understood sufficient Spanish to understand what the key messages are and translate the abstract into English, so it could be accessible. So, definitely there's encouragement to do so. Now, I think, where it becomes a little problematic to represent those voices is when community or individual or regional impacts that people feel and know they feel and have experienced on their bodies with their lives are not necessarily “counted” in the way evidence is understood within the narrow IPCC formulations. And evidence, for example in the fifth assessment report on observed impacts, were dependent on some paragraph or sentence in the publication that clarified whether or not the climate hazard experienced - a flood, a drought, a heatwave - could be at least to a certain extent be attributed to climate change. It’s called attribution, it's a really complicated technical field of science - very, very important - but many of the publications, especially those in the grey literature, did not have the necessary attribution statements, and hence did not “count” in the global assessment of direct impacts. We still could write about them in our chapter. But in the chapter evidence, there was at risk that the chapter evidence in massive synthesis assessment is somehow misinterpreted as local anecdotal evidence rather than verifiable science and that's where it becomes contentious.

**James**

I mean the IPCC, I think, has struggled for quite a long time to bring in alternative ways of understanding the world and understanding change. You know, if you look across the five assessment reports of the IPCC - starting in the 1990s and including the more recent special reports - I think some progress has been made. We do have a more social science engagement now than there was, you know, even 5-10 years ago. We're also seeing some engagements of the humanities, but it tends to be in a very top down manner: engagement on the terms of the natural sciences. So, you know, your example of what evidence “counts” is a really graphic illustration of that. The IPCC is trying to bring in alternative ways of knowing. As part of the 1.5 assessment, which I was involved with, there were attempts to say: how can we better integrate Indigenous and local knowledge. But there's also push back. I was involved in one of the working groups as part of this, where a number of colleagues at the table were saying: Indigenous and local knowledge just are not science; it doesn't mean anything; they have got no value, it has got no worth, it shouldn't be in the IPCC. Those voices are still there and they're still pushing back. We were able to say that this work is documented in decent journals. Therefore, we were able to get it in there, but we shouldn't really have to be doing that. The knowledge should really speak to itself. There's a lot the IPCC can learn from other assessments like IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystems Services - like a number of national assessments, like in the US and also in Canada, which actually brought to the table Indigenous knowledge holders as part of the actual assessment process. It has helped to integrate different ways of knowing from the outset, from actually designing the structure of chapters, to writing the chapters and deciding what kind of evidence counts. IPCC is nowhere near that yet. We're certainly looking ahead to say, the seventh assessment or the eighth? I think there's a lot of opportunities for the IPCC to really evolve, to change how it does things. Whether it will or not, it's hard to say, it's a very conservative organization. But we are definitely seeing pushback from scientists, like myself, Petra, and others saying: we do need to change, we can't keep on doing things the same way that we always do them. And I think that the voice and the momentum is improving. So, maybe for AR7 - when you are authors yourselves.

**Petra**

Well said.

**Paloma and Bianca**

Thank you. Thank you very much.

**Petra**

Thank you for having us!