Ways & Means Season 8, Episode 4: How Cleaner Cookstoves Can Help Build a Healthier Planet

Lauren Rosenthal: From the Sanford School of Public Policy at Duke University, I'm Lauren Rosenthal.

Subhrendu Pattanayak: So here I am in Busia County, in rural Kenya.

Lauren Rosenthal: This is Duke professor Subhrendu Pattanayak. Busia county is near the border of Uganda. Subhrendu's team flew from North Carolina to Kenya and met up with colleagues from the University of Nairobi. They have been driving for hours to reach this remote area, where they are running a research project.

Subhrendu Pattanayak: I'm traveling with Maxwell, who's driving here for us (yay Maxwell!), and Erin Litzow, a former Duke student currently at University of British Columbia. So, Erin, what do you think we'll see when we get there?

Erin Litzow: I think we'll see a lot of fields growing a lots of different crops like cassava, corn, beans, sugar cane…

Lauren Rosenthal: They've set out to explore an issue that is a big contributor to climate change, but one that doesn't grab the headlines: families who cook using fire.

Subhrendu Pattanayak: So just to put this in perspective, about half the world -- still -- half the world, you know, three point some billion people rely on biomass to cook.

Lauren Rosenthal: Biomass is organic matter. Every day, billions of people around the world walk outside to gather tree limbs and sticks, anything that burns, really. They use the material to start fires, and then they cook breakfast. And for the rest of their meals that day, they do it over and over again.

Subhrendu Pattanayak: That's right, so it's unbelievable for most of us because we wake up in the morning and we hit a switch and, you know, this magical black liquid called coffee comes out and then we are all great and ready to go.

[Vintage coffee commercial]

Lauren Rosenthal: But for half of the world …

Subhrendu Pattanayak: That's not true. If you want the first cup of coffee and tea, you actually have to walk, gather the firewood, bring it back, get a fire going. And so the first cup of tea or coffee or whatever beverage that they drink in that part of the world is at least 45 minutes away from consumption.

Lauren Rosenthal: And these cooking fires whipped by half the world's population several times a day, every day --- they are contributing to climate change.

Subhrendu Pattanayak: It's about a fourth of the climate problem. So one fourth of the pressure on the climate from our activities is actually coming from the use of biomass fuels. So it's a pretty big deal.

[Intro Music]

Lauren Rosenthal: In this episode of Ways & Means - how upgrading stoves for people in developing countries could bring about a double win --- improving people's lives while making a big contribution to fighting climate change.

Subhrendu Pattanayak: So most of my work has been in South Asia and on cooking issues, so mostly rural Nepal, rural India. But recently we've started working in different parts of Africa: Malawi, Zambia, Tanzania…

Lauren Rosenthal: Subhrendu Pattanayak is passionate about cookstoves. He has conducted numerous research studies focused on them. He has even delivered cookstoves to remote mountain communities by carrying them -- on his head!! -- up steep paths. He's in Africa now, but he recently completed a three-year study with 1,000 rural Indian households in the Himalayas. He says that while the communities he visits around the world are often very different, how people cook, that's often very much the same. Many people cook over open flames. It's a lot like cooking over a campfire.

Subhrendu Pattanayak: You show up at a campsite, it's late, you find three stones and you kind of create like a tripod and you put your pot on it and you stick pieces of wood under that, right?

Lauren Rosenthal: Recently there have been major technological advances. There are now inexpensive cookstoves that would make life much easier for families. Some use electricity, and some use wood, but not as much – and the stoves burn way more efficiently. But the research clearly shows that in many areas of the world, the new technologies aren't catching on. Trips like this will help researchers understand why by finding out how cookstoves fit into people's household budgets, their day-to-day lives, and what's keeping them from making the switch. When they get close to a community, on this trip along the Uganda border, team members get out of the car and walk down a dirt path.

Subhrendu Pattanayak: So now we are walking towards some of the households that are a part of the study. This is a typical community path …

Lauren Rosenthal: They reach a small compound.

Subhrendu Pattanayak: There's a cluster of houses, a home garden …

Lauren Rosenthal: One has a thatched roof, one has a corrugated roof. The homes surround a wide grassy area. Laundry is hanging on the line. The air is heavy with the smell of smoldering wood. The homes belong to a single extended family – grandparents, their two sons and their families. The matriarch is wearing a yellow print dress with a matching headscarf. A cat curls around her flip-flops. She welcomes Subhrendu and his colleagues into her tiny, windowless kitchen.

Subhrendu Pattanayak: She has just been cooking, that's why the fire is still active?

Man: Right, you can see the smoke

Subhrendu Pattanayak: The smoke is rising from it? Yeah.

Lauren Rosenthal: The fire is still warm. It's been a while since breakfast, but even so, whisps of smoke linger, and swirl lazily up and slowly – very slowly -- out tiny holes in the roof and gaps between the roof and the walls. The researchers move outside.

Subhrendu Pattanayak: You can see that the smoke is coming out of the kitchen, even though I am standing outside, already I am pretty choked up, so…

Lauren Rosenthal: The team considers two woodpiles - one with big branches is about knee high, and the kindling pile is smaller. Subhrendu asks the translator how long the piles will last for the kitchen stove.

Man: So it takes about one week.

Subhrendu Pattanayak: One week to use all of that up? So, if there was this new stove, maybe it would last two weeks, right?

Man: Yes.

[Music]

Lauren Rosenthal: When researchers first began considering the fact that billions of people cook over open flames, the climate was not on their minds. At first, researchers were focused on the threat to human health.

Subhrendu Pattanayak: I mean, when you've done a campfire, if the wind changes direction, you cannot breathe on your own and you walk over to the other side. Now, these people don't have the ability to just dabble with cooking a marshmallow. Right? So they are breathing that in every day and there's little kids around them. And then, you know, it's not like the husband is somewhere else, he's just in the room next. So, they are breathing the smoke. And it's -- it's causing all kinds of human health effects, some rate it as the number two killer in the world.

Lauren Rosenthal: Think stroke, heart disease, chronic obstructive pulmonary disease, or COPD, lung cancer– even burns to children from the open flames. But cooking fires aren't just bad for human health. They're also damaging to the climate. Trees play an important role in keeping things balanced. They soak up excess carbon dioxide in the air, and carbon dioxide, of course, is one of the major drivers of climate change.

Subhrendu Pattanayak: You know, there are so many trees and they grow so fast and there are many more people and they collect them faster than the trees grow. So this is bad for forests and for trees, etc.

Lauren Rosenthal: And that's not all - beyond the loss of trees, experts say the smoke from the cook fires does far more than make us cough.

Subhrendu Pattanayak: It actually climbs up higher into the sky and adds black carbon.

Reporter Voice: Black carbon is the fancy name for soot. And, like carbon dioxide, it's causing changes in the Arctic climate…

Subhrendu Pattanayak: A lot of attention is on carbon dioxide which are cars and you and I and, sort of, American and western societies generate, but black carbon is sort of 25% of the problem. It's one-fourth of the problem. So it's also causing global warming.

Lauren Rosenthal: Usually, when we think of climate change, we think of greenhouse gases that are causing the problem. But particles like black carbon are a big part of the problem, too. "Black carbon" is the stuff that makes soot black. It can come from burning fossil fuels, forest fires, but also cooking fires. It rises into the atmosphere, where it absorbs light and heats up its surroundings. Then, that black

carbon falls back to earth and continues to damage the environment in all kinds of ways. Like, it can make snow turn this dingy shade of gray. Which means, it doesn't reflect the sun as effectively. Another contributor to a warming climate. The good news is that black carbon doesn't stick around that long compared to carbon dioxide, which can linger in the atmosphere for hundreds or thousands of years. Black carbon only sticks around for a few days to a week. So, any effort to cut back on it should have immediate benefits both for the climate and human health. That's according to a UN initiative called the Climate and Air Coalition. And the new cookstove technology? Well, there are a bunch of options that are super simple. In one version, that's currently being used in Sub-Saharan Africa, the stove is based on a design that is made from bricks that women in the community can make themselves. Imagine a small table, made of bricks, with a tiny opening for the sticks and the fire. There's a simple stove top, with room for a pot on top for cooking. Another example is like one westerners might use on a camping trip. The designs vary, but all the new stoves are very efficient. They either use electricity or wood or other biomass, but not nearly as much, and they don't release as much smoke.

Subhrendu Pattanayak: The new stoves, it's a lot more efficient and it's trying to drive the heat into the space in the part and not lose it to the air

Lauren Rosenthal: Stoves like this can cost as little as $10 but what seems like a small fee in the west, is a big purchase for many people in countries that are still developing. And researchers have tried to figure out ways to make money less of an object for families who want to switch. You'll hear more about that in a minute. So if the new cookstoves have so many advantages over cooking on an open fire, why don't more people use them? That's something Subhrendu Pattanayak and his students and colleagues at local universities have been trying to figure out. They've been doing studies about why some families are hesitant to try this new technology - something that has the potential to dramatically improve their well-being. For starters, the researchers have found, change is hard! If you've always done things a certain way, and it works, why change now? At the beginning of this episode, we talked about a study Subhrendu and colleagues conducted with 1,000 Indian households in the rural Himalayas. Over 5 years, the team designed and tested cookstoves in that region. The drawbacks were clear. For example, one particular stove was great, and people liked it, but it ran on electricity which was often not reliable in many of the remote locations. Like it was only available for a couple of hours a day. Researchers found the cost of the stoves can be a barrier too. But when families were also offered payment plans and rebates, and the ability to choose what type of stove they wanted, demand shot up: As many as 50% of the households purchased a new stove. Researchers found there's one other potential selling point that these newer, cleaner cookstoves have — they could save people a lot of time. In their research study in rural Kenya, Subhrendu's team hopes to better understand the time issue. They want to find out more about how much time people spend gathering fuel and tending their traditional stoves, especially the local women who do most of the cooking. To get at this, the researchers have brought sheafs of pictures that show different ways local women might spend time during the day. They spread out the pictures on the ground, and give the women markers to put on the pictures. The more markers a woman adds, the more time she spends doing the task each day. Subhrendu is standing nearby, quietly narrating the action for us on his phone.

Subhrendu Pattanayak: Our enumerator is trying to capture, what else it is she spend time on. She is studying her options…

Lauren Rosenthal: This is the matriarch's daughter-in-law – she's wearing a bright pink sweater and skirt -- and she considers her options closely.

Subhrendu Pattanayak: Just little bit on child care. And then….some time on cooking, and that's the question, how much of that time that she spends on cooking will change if there's new technology…

Lauren Rosenthal: Subhrendu says this question of "women's" time hasn't been widely studied. See, in addition to health and climate issues, cooking over an open flame is a lot of work. It has an impact on people's well-being. Here In rural Kenya, it's clear that most of the work is done by women and children. They have to find fuel for the fire – whether that's wood or biomass. They have to collect it, haul it, start the fire, keep the fire going…and that's before the cooking even begins. The team has been asking women how much time it really takes to cook using traditional methods. Separately, the researchers have also been asking the men -- how long they think it takes to create a fire and cook a meal, start to finish. These answers – from families here in Kenya, and in the other research areas of Malawi, Tanzania, and Zambia, will become baseline data, which will help researchers understand if time savings are enough to motivate families to make the jump to cleaner stoves. This type of research is really important, especially now, Subhrendu Pattanayak says. Climate change is an urgent issue, and this is a part of the problem that can be addressed relatively easily.

Subhrendu Pattanayak: In this part of Africa, electricity is not common. Gas is not common. So, we can either wait around for another 20 years for these things to arrive, and a lot of these harms will continue. Or we can say, in the meanwhile, can we do something that buys us, you know, gives us some time to alleviate these problems while the technology is coming and we're moving towards electric cooking or gas-based cooking or something that doesn't use biomass

Lauren Rosenthal: It's a more responsible way to approach development, he says.

Subhrendu Pattanayak: It's a little bit of a middle ground because we can help them not follow our crazy lifestyle. Right? And they can have cleaner technologies which let them have prosperous lives without damaging the environment.

Lauren Rosenthal: And if researchers can figure out what would make more people choose to switch to clean cooking stoves now, they can make a better case for Western investment in that technology.

Subhrendu Pattanayak: With all this information, we're working with companies, the private sector, banks, civil society governments that are trying to see how new finance can flow into this sector because if there are these social values being created by these technologies and by the way, our climate gets cleaner, and the forests get cleaner, you and I might be willing to pay for those technologies, right? So it's a mechanism to get resources from those who have and will benefit when the climate is cleaner to those who don't have much.

Lauren Rosenthal: Also, Subhrendu argues, it's simply the right thing to do when it comes to well-being of our fellow humans - particularly women,

Subhrendu Pattanayak: So so think of these new technologies that we have in mind that will require less firewood or no firewood. So all of a sudden, who saves time? Women will save time. Whose health is affected? Women's health will be affected because they're there. If it's not women, it's young girls, it's kids. If you care about the environment, you're interested in this, you care about the climate, you're

interested in this, you care about health, you're interested in this, you care about women and girls. You're interested in this.

Lauren Rosenthal: Climate change requires that all of us make changes. In the west, we need to stop eating so much meat, adopt renewables like solar, stop driving so much in our individual cars and more. If we can do that and help people in countries that are still developing to adopt cleaner technologies now…now, that would be a huge win for the climate.

[Music]

Lauren Rosenthal: We'll have a link to some of Subhrendu Pattanayak's research on our website – and we've got a short video featuring Subhrendu and his team - and those cookstoves – from their recent trip to Kenya. We're at ways-and-means-show-dot-org. The research is funded by CQuest Capital and the Clean Cooking Alliance. Ways & Means is produced by Carol Jackson and Alison Jones with help from Hannah Otos and Kirsten Khire. Our Duke student team includes assistant producer Akshay Gokul and artist Joy Liu. Our engineer is Johnny Vince Evans. And I'm your host, Lauren Rosenthal. Thanks so much for listening.

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