

## **Episode 4: Bolivia WATCH: The Chiquitania Wildfires and Water Resources**

Sun, Feb 20, 2022

### **SUMMARY KEYWORDS**

fire, forest, Bolivia, Chiquitania, watersheds, people, water, wildfires, impacts, management, land, tool, government, community

### **SPEAKERS**

JC Giraldo  
Vishal Mehta  
Bart Wickel  
Jeanne Fernandez

JC

0:11

Water is fundamental to human development, from drinking water and sanitation to agriculture and more. You're listening to Water Stories, a podcast series where you will learn everything about securing water, energy and food security for all of us. Hello, everyone, I am Juan Carlos Giraldo and welcome to Water Stories.

The Chiquitano forest is the largest of the world's few remaining dry forest ecosystems mainly located in Bolivia, between the most extensive river basin, the Amazon, and La Plata in South America.

But in 2018, the Chiquitano forest suffered one of the largest wildfires in Bolivia history. In this episode, we will discuss with our guests how this event affects the water resources in the Chiquitania region and how they are working on this particular issue.

My co-host, once again, is Vishal Mehta. Vishal is an environmental scientist of the Stockholm Environment Institute. And his work is focused on water research and forest conservation. He is based in Davis, California. Vishal, how are you? An interesting topic to discuss in this episode with our guests, right?

Vishal

1:23

Yeah. Hi, JC, certainly. And it's directly relevant to some of us who live here in California, as you know. Even in January, just last month, there was a wildfire in Monterey right in the heart of winter. So I'm really looking forward to hearing from my colleagues' work on wildfires in Bolivia, and having our listeners make connections to their own experiences, wherever they are.

JC

1:47

Thank you, Vishal. And today we have two new guests, Jeanne Fernandez and Bart Wickel, both scientists from the Stockholm Environment Institute, both with vast experience in sustainable water management. Hello, Jeanne, how are you?

Jeanne

2:00

I'm very good. Thank you for having us on this podcast.

JC

2:05

Glad to have you. Bart, how are you?

Bart

2:08

Great, thank you.

JC

2:09

You know, I was born in Peru. So which is near to Bolivia, right? And the Amazon and all these beautiful lands, I always think of in constantly challenges, and let's start a conversation with Jeanne. Jeanne, wildfires are a natural phenomenon in the arid ecosystems, right? However, mega fires are getting more frequent and destructive, not only in Bolivia, but around the world. What got you into this research area that we're talking about right now, focused in this Chiquitania region? Please share what you found and how you started the research.

Jeanne

2:47

Yeah, thank you for your question. We started working on, Bolivia WATCH Chiquitania is the name of the project, because we were already doing some work in Bolivia and various watersheds and working with the Ministry of Environment to develop watershed management plans. And then when the mega fire event happened in 2019,

we realized that there was, I don't know if I can call it opportunity, but an issue of having to integrate the impacts of fires on water resources and then thinking about how that can affect the hydrology and the ecosystems in the watersheds in the Chiquitania region. So that's how we got started and developed this project, Bolivia WATCH Chiquitania, where we're trying to look at the history of fires in the region and trying to map them at the watershed scale to see where the water resources might be at risk.

JC

3:59

I have a question, Jeanne. This Chiquitania region is nearby Santa Cruz de la Sierra, nearby? Or is it just near La Paz, or Cochabamba?

Jeanne

4:09

Yes, near Santa Cruz.

JC

4:11

Santa Cruz is one of the most important cities in Bolivia, after La Paz, Cochabamba, Oruro. Vishal?

Vishal

4:18

I was wondering if Bart and Jeanne could respond to a thought I had, is that the way I see their work is about discovering and communicating the link between fire and water. So Bart and Jeanne, I was wondering on this link, how are wildfires and water connected? Can you explain a little bit about how this connection works? And what is it at stake for the people living in this region and their water resources?

Bart

4:46

First of all, I think it's important to maybe emphasize the context this work plays in. Chiquitania is a dry forest region, as Juan Carlos indicated, on the transition of the Amazon rainforest in the north to the dry Chaco forest in the south. This region in the eastern part of Bolivia is lowlands and it is gradually being transformed from natural forested landscapes to agricultural landscapes. And in this region, we see, basically, the two large drivers of change colliding or reinforcing each other. You see land use change, clearing of forest, by people. And at the same time, we have climate change, which is really creating these flammable conditions, for these mega fires that we've observed over the past years.

These forest ecosystems are naturally adapted to be disrupted by fire. Fire is a common element in this landscape. But one of the challenges that we've seen over the past decades is an intensification of these events. There's deeper and longer droughts that make this forest more flammable, and which has resulted in this event of mega fires. So these fires burn way hotter and way more intensely.

JC

6:14

Bart I have a question before you continue. Always people try to know if the wildfires are caused by humans or they came from droughts or any kind of other condition?

Bart

6:32

Well the fires are always caused by people. Ninety-five percent of the forest fires are started by people. Fire is a very important tool in South America, in agricultural land preparation, and is used by communities, especially smallholder farmers, as their main tool for clearing their land in slash-and-burn agriculture. So it's a very important tool. I think most of the time, they're able to control these land preparation practices. But with this deeper drought, with these new climate conditions presenting themselves, it becomes harder to control fire as they prepare land. And I think that's one of the main drivers for change.

The other aspect of why these fires happen is in certain parts of the region, certain actors benefit from setting the forest on fire because that opens a new frontier. It's community forest or it's government-owned lands, but the fire will clear out new parts, and then those areas become available for expansion of agricultural commodities.

Now linking that to impacts on the water cycle, there's two dimensions. One is the change in the water balance that may occur after a large-scale change of the landscape. And the other is access to the water by people. The biggest challenge in this context, I would say, is that we do not exactly know what the impacts of fire are. There are indications that in certain contexts, you end up with a greater amount of water because your forest is gone. But there's also negative feedback loops that may actually deteriorate the water quantities. And then secondly, the quality of water may be affected adversely depending on the local conditions. So there's water quantity and quality that are affected and that's what we're trying to study here.

Vishal

8:46

Yeah, I was just reminded that, you know, what you mentioned about climate change and land use change intersecting is what we see all around the world also, so in that

sense, it does generalize, but also I was thinking about other impacts, like landslides and erosion after these fires once there is a precipitation rainfall event. JC?

JC

9:13

Yes, I remember the first episode with Chuck and Brian, they mentioned something that Bart just reinforced – the quality of water, the balance of water and the quantity of water – which means the most important is to have sustainable water for all of us. It's a really, really important topic that I remember from this first episode, as well.

Jeanne, I want to ask you something before I pass it to Vishal, I don't know if you guys have any kind of information from the local communities, how they feel about the impact? I mean, probably before, during or after the wildfire, something that maybe you have any kind of information you would like to share with us?

Jeanne

10:02

Yes, well, we are working with a partner organization that's based locally, it's called Agua Sustentable. They have been to visit the communities in the Chiquitania region and ask them about whether they have felt the impacts of the fires and whether there's been a difference for them regarding water quantity or water quality. And some did mention that they had noticed that there was ashes in the water and that they were getting sick from drinking that. So yeah, we do, based on that, know that, that there are these impacts and that the population is being affected. And before the fires, they were already noticing that, in relation to the drought, a lot of wells were dry.

Vishal

10:57

Interesting. So one of the key issues that we have in our projects, at SEI, Jeanne and Bart, as you know, is education and communication about what we learn – what we have learned – in our projects. So in this context, Jeanne, how is your work helping to communicate these issues?

Jeanne

11:17

Well, we're trying to really use visual tools and we believe that with mapping and with visualization, we can better communicate what's going on. It's always challenging to make communication products that are understood not just by scientists, but also by the local people. But we're really trying to show how, considering the scale of the watershed is really important, and how that scale doesn't necessarily match, you know, municipal boundaries or other geopolitical boundaries. So with maps of watersheds

and maps of fire and changes and land cover over time, we're trying to illustrate the key messages in relation to our work,

Vishal

12:22

I imagine, Bart and Jeanne, that it must be particularly difficult to communicate remotely, right? Because you can't actually go and meet people in person. You can do field surveys, you know, social surveys, sociological surveys, have workshops in person that brings together the stakeholders. Is that true in this particular case, since everything is remote due to Covid?

Bart

12:51

I think it has not necessarily been a major challenge so far, since we have been largely working on analyzing the problems at a much larger scale. We've been developing a water resource model for water quantity, conceptual model, we've been doing large-scale mapping with satellite data, and started building an outlet like the visualization tools, and started testing that with our partners and communicating that with our partners in the region as end users and so, so far, the scale at which we have worked, hasn't necessarily required a deep connection on the ground, I'd say. We definitely are planning to connect our, our tools and findings to that level, in the next stage of this project.

So this year, we will be having a set of community-oriented workshops. And in a way, we're sort of following a filter, right? We have been traditionally working with the national government Ministry of Environment. Now we're working with the regional government of Santa Cruz, and through our partners, we are connecting with municipalities and local actors.

JC

14:22

That is interesting. Well, let me tell you that part of the communication, I think the communication is a key on any process, right? And this podcast probably will be a good tool to communicate more and more to the, you know, locals or people who are interested in water management. So speaking about communication, and just Bart mentioned something very interesting, the authorities. So in my opinion, sustainable water, sustainable land and fire management, right, are essential. They are totally related. You guys probably have a good amount of data and information.

Speaking about this, Bart, what can policy-makers, governments, local institutions, also universities, because I read some reports of Stockholm Environment Institute, are

you working with some local universities as well? What they can do with this information that you guys can provide?

Bart

15:13

Our intention is to support the response that the government is mounting at multiple levels to these challenges and provide technical insights that support these strategies.

We tried to link with local researchers and create a community of practice of people that work on this jointly. And I think the main thing we're aiming to do here is bringing all the entities in the region, both civil society and government entities, around a common watershed vision, which in this particular region is quite challenging, as Jeanne pointed out, because of the disconnect between political boundaries and management boundaries and physical boundaries. The watersheds are a logical unit to take decisions and plan for sustainably. But in this particular region, there's a strong mismatch between those boundaries. And so you have a challenging environment. And so our vision is to bring people together around this watershed.

JC

16:29

That's true, it's very challenging, but Latin America is really challenging itself.

So Jeanne, Bart, this is a very intense and very deep, topic, you know. Where people can find more information about it to get probably more familiar with ... where is the region, where is Chiquitania region? Jeanne, where people can find more information? To me what was very useful, the fire and water integrated management that is on Bolivia WATCH, but probably some people want to know, as well.

Jeanne

17:01

So we do have a website or webpage on the SEI website. And so people can look up the name of the project, or just look up "SEI Chiquitania" and I think they'll find various links, also a brief about our work. And then if they have any questions or want links to the visualization project that we developed, they can also email us and we're happy to share more.

JC

17:36

Great, Bart the final thoughts please, maybe you want to share something additional where people can find more information?

Bart

17:44

As Jeanne indicated, we have a set of online resources. We are working with our partners from the Fundación para la Conservación del Bosque Chiquitano, the FCBC, in the region who have an observatory, Observatorio Chiquitano. There's a website where they try to share information about conservation dimensions of this forest. And yeah, we are strongly collaborating with them.

JC

18:09

Perfect. Vishal, final thoughts?

Vishal

18:11

Well, I was just intrigued by the question of land management and its connection to water management. For example, how does forest management differ between, say, California and Bolivia?

Out here in the US, for example, forest thinning is one of the major tools used in managing fire risk. So my mind started going there, you know, what is the management paradigm for forests and fires in Bolivia?

Another question to look at is whether climate change is playing similar roles in these different geographies and ecosystems, which I think they are. So I look forward to learning more along these lines with my colleagues' work. And I want to thank Bart and Jeanne for joining us today. Thank you.

JC

19:00

Exactly. Thank you, Jeanne, for your time.

Jeanne

19:02

Thank you very much.

JC

19:03

Thank you, Bart, for your time.

Bart

19:04

Thank you, JC. Nice to meet you.



JC

19:06

Nice to meet you, as well. Thank you, Vishal, again. Until the next episode,

Vishal

19:10

My pleasure. Thank you so much.

JC

19:12

Thank you for listening to Water Stories. Remember, you can find us on Spotify, Apple Podcasts or Google Podcasts. Stay tuned for our next episode. Thank you so much, everyone.