

00:00:13,380 --> 00:00:14,880
Very good, good morning everyone.

00:00:15,840 --> 00:00:19,200
Thank you for coming out so early on a Saturday morning.

00:00:20,100 --> 00:00:25,120
I'm going to talk to you about some ongoing research that I've engaged in along with some colleagues.

00:00:25,379 --> 00:00:29,670
My colleague, Scott Furst, in the Geography Department, Doug Gamble, who's in Geography down

00:00:29,670 --> 00:00:34,130
at UNC Wilmington, and we're working with some folks down at the University of West Indies in

00:00:34,130 --> 00:00:35,889
Jamaica, especially mine and Gamble.

00:00:36,569 --> 00:00:42,090
And this is a project looking at the relationship between climate change and agriculture.

00:00:42,430 --> 00:00:51,169
So, small farming in Jamaica is facing a lot of difficulties from both climate change and from

00:00:51,169 --> 00:00:52,509
a lot of economic changes.

00:00:52,790 --> 00:00:54,729
So, a little bit of background.

00:00:55,590 --> 00:01:00,750
We can think about how small farmers in the Caribbean region are under stress, and they are

00:01:00,750 --> 00:01:01,930
from a lot of different angles.

00:01:02,669 --> 00:01:06,790
On the one hand, there are climate issues that small farmers are facing.

00:01:08,430 --> 00:01:14,069
IPPC, the International Panel on Climate Change, has suggested that the Caribbean is likely

00:01:14,069 --> 00:01:19,629

to see more variable rainfall, an intensification of storms, and a greater incidence of drought.

00:01:20,349 --> 00:01:25,809

So, farmers in the Caribbean region, I think, are especially vulnerable to these kinds of things. They're small states.

00:01:27,230 --> 00:01:33,150

Sea level rise is another issue that small farmers are very interested in, or concerned about,

00:01:33,230 --> 00:01:34,410

rather, in the Caribbean region.

00:01:34,790 --> 00:01:35,849

It's not just climate, though.

00:01:35,849 --> 00:01:39,709

There's also a series of economic changes that have taken place over the last couple of decades.

00:01:40,510 --> 00:01:45,849

Agricultural policy is changing, in particular, more free trade, allowing cheaper imports, which

00:01:45,849 --> 00:01:47,389

compete with the local farmers.

00:01:47,809 --> 00:01:52,269

There are land pressures, urbanization, and other kinds of development activities.

00:01:52,970 --> 00:01:58,690

And in many Caribbean states, there's a lot of rural to urban migration, as livelihoods are

00:01:58,690 --> 00:02:03,889

less viable in the countryside, people move to the cities, and then we get the concomitant problems

00:02:03,889 --> 00:02:10,210

of dramatic urban informal settlements and all the policy challenges that they provide.

00:02:10,309 --> 00:02:15,929

So, the project that I've been involved in is trying to understand these two different types

00:02:15,929 --> 00:02:17,529

of stress that farmers are facing.

00:02:17,990 --> 00:02:21,529

And in the literature, this is sometimes described as a double exposure.

00:02:22,250 --> 00:02:27,369

Farmers are exposed, on the one hand, to climate stress, and on the other hand, to economic stress.

00:02:27,429 --> 00:02:32,630

And so, we wanted to try to assess what this double exposure looks like for farmers in the Caribbean.

00:02:32,750 --> 00:02:34,190

Here's just a quote from the literature.

00:02:35,050 --> 00:02:40,350

O'Brien and Lytenko say, by double exposure, we refer to the fact that regions, sectors, ecosystems,

00:02:40,470 --> 00:02:46,869

and social groups will be confronted both by the impacts of climate change and the consequences of globalization.

00:02:47,050 --> 00:02:49,470

Or we could think about that as economic changes.

00:02:51,389 --> 00:02:58,149

Just very briefly, for those of you that don't know much about how policy discussions are oriented

00:02:58,149 --> 00:03:06,910

around these kind of stresses and risks that are faced by small farmers, you might hear of three different kinds of terms.

00:03:07,149 --> 00:03:12,350

A lot of times we speak of the vulnerability that are faced by people in various parts of the

00:03:12,350 --> 00:03:14,809

global south and the Caribbean, specifically for us.

00:03:15,750 --> 00:03:21,330

Vulnerability refers to the way that populations are exposed to certain kinds of stresses and

00:03:21,330 --> 00:03:22,690

how they might impact them.

00:03:22,770 --> 00:03:28,089

So, there's a lot of work going on trying to measure vulnerability of small farmers in different parts of the world.

00:03:28,669 --> 00:03:31,990

People also speak of resilience, which is a slightly different concept.

00:03:32,630 --> 00:03:35,970

Resilience is more of a level of an ecosystem or a system.

00:03:36,229 --> 00:03:41,490

A lot of it comes from computer science and systems thinking, but it refers more about the ability

00:03:41,490 --> 00:03:43,830

of a system to cope with stress.

00:03:44,449 --> 00:03:51,509

And then lastly, you also hear a lot of talk about adaptation, which is how systems, local farmers,

00:03:51,889 --> 00:03:57,550

can adapt to changing circumstances and cope with the changes that may be around them, either

00:03:57,550 --> 00:03:59,410

in terms of climate or the economy.

00:03:59,869 --> 00:04:04,869

So, our broad project is aimed at trying to evaluate this double exposure.

00:04:05,449 --> 00:04:08,910

What are farmers facing on the climate side and on the economic side?

00:04:09,070 --> 00:04:16,950

And how does that relate to vulnerability, resilience, or adaptation on the ground for particular farmers?

00:04:17,690 --> 00:04:23,670

So, we've been, over the last couple of summers, doing some field work and we're taking a kind of mixed methods approach.

00:04:24,250 --> 00:04:31,670

Scott and Doug are atmospheric scientists and what they are actually engaged in is sort of collecting

00:04:31,670 --> 00:04:35,350

data on changes in the local climate.

00:04:35,489 --> 00:04:40,190

So, we're setting up rain gauges and measuring rainfall and they're taking temperature readings

00:04:40,190 --> 00:04:42,190

and looking at soil moisture and that kind of thing.

00:04:42,230 --> 00:04:43,890

So, we're gathering some scientific data.

00:04:44,589 --> 00:04:49,109

I'm the ethnographer around the team and so my interest is actually talking to people and understanding

00:04:49,109 --> 00:04:51,390

how they perceive these changes.

00:04:51,730 --> 00:04:57,369

So, we're also doing surveys and interviews with farmers and local officials in Jamaica and

00:04:57,369 --> 00:05:02,890

we're asking farmers to fill out what we're calling water logs to kind of describe what are

00:05:02,890 --> 00:05:06,910

you experiencing in your local climate, how are you responding to them, are you making changes

00:05:06,910 --> 00:05:10,470

in what you do with your cropping patterns, and so on.

00:05:10,570 --> 00:05:15,209

So, we're doing this in southwestern Jamaica, the parish of St. Elizabeth.

00:05:15,329 --> 00:05:20,470

This is the region where most of the country's basic vegetable and fruit crops are grown.

00:05:20,570 --> 00:05:26,730

So, this is not big scale export agriculture of sugar cane or coffee or anything like that. It's small farms.

00:05:27,450 --> 00:05:30,750

They're not highly mechanized, locally owned.

00:05:31,970 --> 00:05:37,029

Cultivation can be done year round, so most farmers plant a succession

of crops around the year.

00:05:37,570 --> 00:05:40,049

Most of this, again, is aimed at the domestic market.

00:05:40,290 --> 00:05:42,190

These are not big farms that are trying to export.

00:05:42,429 --> 00:05:43,970

It's basically for local consumption.

00:05:44,309 --> 00:05:53,269

We're looking at three areas in particular, Hounslow, Potsdam, and Flagomant, and the conditions are slightly different. These are the altitudes.

00:05:53,730 --> 00:05:55,989

Potsdam is higher up, much cooler crops.

00:05:56,350 --> 00:06:00,429

They grow things like cabbages and carrots, whereas Flagomant and Hounslow are a bit lower.

00:06:00,970 --> 00:06:06,190

You find more things like peppers and tomatoes and sweet potatoes and a lot of other crops.

00:06:06,429 --> 00:06:08,630

Here's just some images about what it looks like.

00:06:09,309 --> 00:06:14,549

Flagomant, you can see these low-lying plains in the farm fields here. Hounslow is quite similar.

00:06:15,589 --> 00:06:16,510

Potsdam is a little bit different.

00:06:16,670 --> 00:06:18,369

That's that higher altitude area.

00:06:18,690 --> 00:06:20,369

You can see a crop of cabbages here.

00:06:20,850 --> 00:06:25,609

Cabbages wouldn't survive very well down here in the hot, dry plains of Flagomant.

00:06:26,709 --> 00:06:31,170

Hounslow in particular has two characteristics that are important that I'll talk about a little bit later.

00:06:31,369 --> 00:06:37,929

One is there are underground irrigation systems in Hounslow that roughly are around this area.

00:06:37,989 --> 00:06:43,149

If you live within this gray shaded area, you have access to a sprinkler system.

00:06:43,269 --> 00:06:48,929

You can put your pipes, hook up to the underground pipes, and basically have irrigation for your farm.

00:06:48,929 --> 00:06:54,329

Presumably a pretty good thing, especially if you're facing increased drought because of climate change.

00:06:54,690 --> 00:06:58,609

Secondly, in Hounslow, there's a new packing facility.

00:06:58,869 --> 00:07:02,049

This is a brand new processing facility.

00:07:03,149 --> 00:07:10,070

This company is making contracts with local farmers to supply them with tomatoes and peppers.

00:07:10,549 --> 00:07:14,250

They get processed, turned into frozen vegetables that end up in the supermarket.

00:07:14,250 --> 00:07:19,630

For some farmers, there's a new market opportunity to get involved with this kind of farming,

00:07:19,829 --> 00:07:23,429

but only certain farms, as I'll talk about a little bit later.

00:07:25,290 --> 00:07:28,489

The first thing we wanted to do, and what we've been doing over the last couple of summers,

00:07:28,570 --> 00:07:30,989

is trying to assess the double exposure.

00:07:31,149 --> 00:07:33,109

What is it that farmers are feeling stressed about?

00:07:33,209 --> 00:07:35,670

What are they facing in their day-to-day activities?

00:07:36,309 --> 00:07:38,149
Let me talk first about the climate side.

00:07:38,269 --> 00:07:39,690
Again, this is not my expertise.

00:07:39,869 --> 00:07:41,589
I can do this fairly quickly.

00:07:41,589 --> 00:07:45,769
From interviews with farmers, they've told us three things that they're noticing.

00:07:46,369 --> 00:07:51,049
One, they say it seems to be getting warmer here in southwestern Jamaica.

00:07:51,769 --> 00:07:56,209
This is just a graph that Scott and Doug put together that shows you average temperatures.

00:07:56,529 --> 00:08:00,570
This is from readings in Montego Bay, which is quite far away from St.

00:08:00,829 --> 00:08:03,769
Elizabeth Parish, but we don't have temperature data from St. Elizabeth.

00:08:03,769 --> 00:08:08,970
This is an indication of what might be happening in our study area as well.

00:08:09,549 --> 00:08:13,489
Temperatures generally trending upward, but it's hard to say for certain.

00:08:14,429 --> 00:08:19,630
Secondly, farmers tell us that the rainfall patterns seem to be more variable.

00:08:20,130 --> 00:08:26,709
In particular, they talk about garden rains as the kind of gentle rain that soaks the soil and

00:08:26,709 --> 00:08:29,570
is very good for crops, becoming less common.

00:08:29,570 --> 00:08:36,369
So-called pond rains that come down in a torrent and create water,

staining water around the

00:08:36,369 --> 00:08:40,890

farm fields, not very good for agriculture, becoming more common.

00:08:41,570 --> 00:08:50,510

There's also been an increase in tropical storms, so there seems to be increased variability in the climate.

00:08:50,510 --> 00:08:58,450

Even as they say there are more heavy storms, farmers also tell us there has been an increase in localized drought.

00:08:58,630 --> 00:09:04,210

That in particular years, there's not enough water to grow good crops and that this is a concern for them.

00:09:05,890 --> 00:09:10,830

On the climate side, it does seem that there are some stresses that farmers are facing.

00:09:11,489 --> 00:09:13,270

Sorry, let me zoom through this too.

00:09:14,390 --> 00:09:17,549

So, what about the other side of the double exposure question?

00:09:17,690 --> 00:09:21,570

What kind of economic or social challenges are farmers facing?

00:09:21,950 --> 00:09:27,049

Again, this is primarily from doing interviews with farmers and asking them, what gives you stress as a farmer?

00:09:27,250 --> 00:09:29,130

And they also point to three different things.

00:09:29,690 --> 00:09:34,489

Number one, the cost of inputs are going up.

00:09:35,729 --> 00:09:39,270

And here I've got some quotes that I'll read to you.

00:09:39,489 --> 00:09:45,549

And I apologize in advance for my fairly poor Jamaican patois, but I'll give it my best shot.

00:09:45,950 --> 00:09:50,289

So, here's a farmer that says, the problem is chemical, expensive.

00:09:50,809 --> 00:09:53,150
Fertilizer, keep on raising, regular.

00:09:53,650 --> 00:09:56,549
Seed, the seed we get coming from abroad, expensive.

00:09:56,849 --> 00:09:58,869
So, it's hard for you to buy them stuff.

00:09:58,989 --> 00:10:01,950
And you put it in the ground, you end up at a loss.

00:10:03,010 --> 00:10:09,309
So, everybody talked about how the price for the things that they need to be successful as a farmer keep going up.

00:10:09,750 --> 00:10:11,669
Prices for farm products, not so much.

00:10:12,409 --> 00:10:15,369
Secondly, a lot of farmers complain about higglers.

00:10:16,289 --> 00:10:21,109
Higglers are basically middlemen that come by with a truck to take the product to market.

00:10:21,210 --> 00:10:28,869
A lot of these small farmers don't have a vehicle, and they're basically relying on these transporters to come by.

00:10:28,869 --> 00:10:33,010
They make an agreement, then they take their crop to the market.

00:10:33,469 --> 00:10:37,130
And in this trade-off, most farmers think that they end up losing.

00:10:37,409 --> 00:10:38,809
So, here's what one farmer says.

00:10:39,270 --> 00:10:42,809
When the crop come and you're ready to reap, the higglers then determine the price, you know.

00:10:43,229 --> 00:10:47,369
And you refuse to sell it at that, then just go to the next farmer and inset.

00:10:48,070 --> 00:10:51,849
So, in other words, these higglers come by and say, I'm going to give you a dollar a pound for

00:10:51,849 --> 00:10:53,250
your tomatoes, take it or leave it.

00:10:53,710 --> 00:10:56,150
Tomatoes are ripe, they're going to rot if you don't get them to market.

00:10:56,150 --> 00:11:00,590
And you really have no choice but to accept what the higgler is asking.

00:11:01,390 --> 00:11:04,309
Then buy it from us cheap, and then go there and make a markup.

00:11:05,010 --> 00:11:08,250
So, when you check it out, the higglers then make more money than we.

00:11:09,030 --> 00:11:11,429
They can buy three, four vehicles, big houses.

00:11:11,830 --> 00:11:13,369
And we, we have nothing.

00:11:14,570 --> 00:11:18,150
So, this is speaking about the lack of capital that farmers experience.

00:11:18,150 --> 00:11:22,450
So, they can't invest in a vehicle, they can't get their crop to market.

00:11:22,630 --> 00:11:27,409
And they're at the mercy of the higglers to get their crop to the market.

00:11:27,929 --> 00:11:33,729
And then lastly, a whole lot of farmers told us that the prices fluctuate dramatically over

00:11:33,729 --> 00:11:35,229
the course of the season.

00:11:36,409 --> 00:11:38,150
Farmers talk about catching the crop.

00:11:38,969 --> 00:11:44,530
Which means, if you time it so that you're reaping it right when the price is high, you're going to be okay.

00:11:44,609 --> 00:11:47,010

But if the price is low, you're in big trouble.

00:11:47,710 --> 00:11:50,770

Sometimes a whole year, you're lucky enough to catch one.

00:11:51,590 --> 00:11:54,270

Lose, lose, lose, catch one. That's the cycle.

00:11:55,609 --> 00:12:00,210

The same farmer says, you have to be constantly timing the market and hope that you catch it this time.

00:12:00,450 --> 00:12:04,049

Which is not, he admits, a very good way to do business.

00:12:04,450 --> 00:12:07,109

So, your tomatoes are ripe, you've got to sell them.

00:12:07,349 --> 00:12:11,789

You just have to sell at whatever that market price is at the moment.

00:12:12,710 --> 00:12:19,450

Part of the problem is that a lot of farmers in the region are planting the same kind of thing.

00:12:19,609 --> 00:12:22,510

And so many farmers say, at certain times of the year, we get a glut.

00:12:22,789 --> 00:12:24,330

And that's when the prices are low.

00:12:24,770 --> 00:12:25,929

You see what happened now?

00:12:26,190 --> 00:12:28,429

A lot of farmers have been planting the same thing.

00:12:28,690 --> 00:12:29,750

So we call it a glut.

00:12:30,710 --> 00:12:32,409

That is the time it gets cheaper.

00:12:32,770 --> 00:12:34,489

That's the time we get a beating.

00:12:35,950 --> 00:12:38,289

You plant cabbage, me have cabbage.

00:12:38,609 --> 00:12:40,849

Every Dick, Tom, Harry, everybody has cabbage.

00:12:40,849 --> 00:12:46,169

So it's on the market, so it's cheaper. So farmers are aware.

00:12:46,330 --> 00:12:50,969

And one of the things the Jamaican government has proposed is actually an information sharing system.

00:12:51,090 --> 00:12:55,390

In which we try to say, okay, there's a bunch of farmers over there that have cabbages in the ground.

00:12:55,669 --> 00:13:02,030

Maybe you should plant peppers or tomatoes so that the same crop isn't all coming due at the same time.

00:13:03,229 --> 00:13:07,890

Here's, I think, an overall statement that suggests what farmers are experiencing.

00:13:07,890 --> 00:13:11,609

Farming right now in Jamaica, four steps forward and five backwards.

00:13:12,049 --> 00:13:16,070

So you cannot survive because you have to buy the chemical at an expensive rate.

00:13:16,450 --> 00:13:18,770

When you crop come, you don't have control over the prices.

00:13:19,070 --> 00:13:21,169

The government leads you to the mercy of the haters.

00:13:21,630 --> 00:13:25,969

So most of the time, what you would like to achieve, you cannot achieve from your farming.

00:13:26,710 --> 00:13:33,010

So I think it sort of sums up the sense of real stress that farmers feel in this area of Jamaica.

00:13:33,109 --> 00:13:36,729

So I think it's clear there is this double exposure going on.

00:13:36,729 --> 00:13:42,830

Farmers are kind of stressed by climate on the one hand and they're stressed by market conditions on the other. Here's a nice summary.

00:13:43,489 --> 00:13:45,330

From last year April, I couldn't catch a crop.

00:13:46,390 --> 00:13:48,190

Plant a tomato, the rain come and take it.

00:13:48,450 --> 00:13:51,849

I plant a cabbage, the price come and take it. Just like that.

00:13:52,729 --> 00:13:55,270

So if the rain doesn't take it, the price takes it.

00:13:55,270 --> 00:13:57,729

Either way, the farmers are not making a profit.

00:13:57,890 --> 00:14:00,210

They're really struggling in this part of Jamaica.

00:14:00,210 --> 00:14:04,469

So one of the things that we want to do as we continue our work is actually to try to provide

00:14:04,469 --> 00:14:10,369

some advice to these farmers to see how they might be able to adapt to these conditions a little bit better.

00:14:13,049 --> 00:14:17,190

So that's the first part of our project basically is to map out this double exposure.

00:14:17,549 --> 00:14:22,390

We have a grant, an NSF grant now to spend the next couple of summers in Jamaica talking to

00:14:22,390 --> 00:14:27,710

more farmers, talking to hagglers, talking to local government officials.

00:14:29,510 --> 00:14:36,960

And there's two ways that I think we're interested in maybe disrupting or making more complex this double exposure idea.

00:14:38,349 --> 00:14:46,049

One of them is to make the point that environment and economy are not just separate things.

00:14:46,070 --> 00:14:50,710

That you have climate stress and economic stress and you just add one to the other and it makes double.

00:14:50,830 --> 00:14:55,750

That there's actually complex interactions between the environment and market conditions.

00:14:55,750 --> 00:14:57,770

And here's a really interesting example.

00:14:58,729 --> 00:15:04,830

This just makes the point that global social change and environmental change actually interact with each other.

00:15:05,830 --> 00:15:14,510

A lot of farmers told us that what we might look at as climate risk or stress can actually be an opportunity.

00:15:15,049 --> 00:15:20,890

And that's because when there are disastrous climate events, that's when the price can go up.

00:15:20,890 --> 00:15:25,349

So there's sometimes an inverse relationship between the growing conditions and the price that you get.

00:15:25,969 --> 00:15:26,950

So here's a couple of farmers.

00:15:27,390 --> 00:15:31,109

You have to have drought to get a good price. A drought wrote fluently.

00:15:31,929 --> 00:15:35,390

And another one said you just let nature take its course.

00:15:35,549 --> 00:15:37,710

If you get through, you'll get a price.

00:15:38,549 --> 00:15:44,530

So one interesting thing is in hurricane season in particular, farmers keep an eye on the satellite

00:15:44,530 --> 00:15:49,030

and when they see a storm coming out in the Atlantic, they plant seedlings.

00:15:49,030 --> 00:15:51,250

They put them wherever they can put them.

00:15:51,429 --> 00:15:52,609

Under their bed, in their kitchen.

00:15:53,190 --> 00:16:01,090

And if a storm hits, the minute that hurricane leaves the island, they're out there in their fields planting tomato seedlings. Why?

00:16:01,289 --> 00:16:06,690

Because six weeks from now, if you've got the first ripe tomato on the island, you're going

00:16:06,690 --> 00:16:08,270

to get a great price.

00:16:08,510 --> 00:16:12,090

So they're all trying to get out in the field as soon as possible.

00:16:12,489 --> 00:16:18,030

So one guy says whenever you have a hurricane, that's the only time you make money out of your crop.

00:16:18,890 --> 00:16:24,750

So who survived while the rest of the perishable washed away? You understand me now.

00:16:24,830 --> 00:16:31,150

What he's saying is I actually like hurricanes because I think I can out-compete my fellow farmers,

00:16:31,690 --> 00:16:37,909

get my crop in first, and get a great price once all the other crops are destroyed by the hurricane.

00:16:38,609 --> 00:16:44,429

So there's some interesting relationships, I think, between climate and the market conditions on the one hand.

00:16:44,429 --> 00:16:50,030

And then one other thing that I think we're very interested in, which is, remember I said in

00:16:50,030 --> 00:16:54,950

the literature people talk about vulnerability faced by farmers, the resilience of local systems,

00:16:55,109 --> 00:16:58,390

and the adaptation to changing circumstances.

00:16:58,909 --> 00:17:03,869

Well, just because we're exposed to a certain kind of climate risk or market conditions, doesn't

00:17:03,869 --> 00:17:05,569

mean they affect every farmer the same.

00:17:05,969 --> 00:17:10,890

And really in the next phase of our work, what we want to understand is what is it that mediates

00:17:10,890 --> 00:17:18,729

between the risk, the hazard, the exposure that farmers face, and whether any particular farmer

00:17:18,729 --> 00:17:20,630

on the ground is able to be successful.

00:17:21,550 --> 00:17:28,750

And one of the key things that we think is playing a really big role is what I'm calling an

00:17:28,750 --> 00:17:36,329

agricultural assemblage, or what we could just really think of as different farming systems. And in particular, water.

00:17:36,530 --> 00:17:40,930

The way that water functions in the local farm economy is really important.

00:17:41,989 --> 00:17:46,829

In case anybody's sort of aware of it or knowledgeable of it, I can tell you what I'm drawing

00:17:46,829 --> 00:17:52,569

on, theoretically, is something called actor network theory, which is, I think, a very influential

00:17:52,569 --> 00:17:57,989

theory within the social sciences developed by Bruno Latour and others.

00:17:58,250 --> 00:17:59,829

I have a bunch of slides on this.

00:17:59,890 --> 00:18:02,250

If you want to ask me questions, I'll be happy to talk about it.

00:18:02,250 --> 00:18:07,469

But it's more of a philosophical discussion that probably will just bore most of us in the room,

00:18:07,530 --> 00:18:09,550

so I'm going to kind of gloss over that.

00:18:10,209 --> 00:18:16,530

But let me briefly give you what we think an indication of how different types of watering systems

00:18:17,010 --> 00:18:19,829

influence farming differently in Jamaica.

00:18:20,189 --> 00:18:25,689

So there are four different kinds of farming systems that we have identified, and the next phase

00:18:25,689 --> 00:18:27,890

of our project is going to be to compare them.

00:18:27,890 --> 00:18:34,729

So at the base level, the farmers with the least amount of technology basically hand water their crops.

00:18:35,089 --> 00:18:38,989

So you see these blue barrels out around the region. They're just rain barrels.

00:18:39,250 --> 00:18:43,650

They collect the rainwater, and then you come in and take water out of the barrel and just pour

00:18:43,650 --> 00:18:46,229

it on each individual plant in your field.

00:18:46,949 --> 00:18:52,569

Fairly low technology, as you might imagine, this kind of system puts people at risk when there's a drought.

00:18:52,949 --> 00:18:58,170

So, you know, one farmer says, if we had water then, we could do any crop. We'd be rich money.

00:18:58,969 --> 00:19:04,109

But because this farmer does not have access to water other than what comes from the sky, he's

00:19:04,109 --> 00:19:08,430

at a certain level of vulnerability in the face of any kind of climate change.

00:19:09,369 --> 00:19:15,290

So stepping up a level in technology, the local or the regional government is sponsoring this

00:19:15,290 --> 00:19:19,969

black tank program, which a truck comes around and fills up the tank.

00:19:20,270 --> 00:19:24,510

Farmers have to pay for this water, but what it means is they have access, even during times

00:19:24,510 --> 00:19:29,790

of drought, and you can see the pipes come through, and basically they can water their crops through gravity.

00:19:29,930 --> 00:19:31,089

It's just a gravity system.

00:19:31,670 --> 00:19:35,010

The water filters down from the tank through the fields.

00:19:35,609 --> 00:19:40,449

So on the one hand, one of the farmers that has a tank said to us, we have a tank.

00:19:40,869 --> 00:19:42,989

We can go on until the rain starts to fall.

00:19:43,050 --> 00:19:45,209

So when there's a drought, this farmer's okay.

00:19:45,329 --> 00:19:51,609

But on the other hand, farmers also told us that the price for water has gone up like three

00:19:51,609 --> 00:19:54,469

times over the last three or four years.

00:19:55,170 --> 00:19:57,290

So this water used to be provided by the government.

00:19:57,630 --> 00:20:01,790

There are now private companies that come by with a truck and fill up your black tank.

00:20:02,849 --> 00:20:07,910

And so one farmer says he had a tank full of water, but then the price of water went up.

00:20:08,229 --> 00:20:10,489

And he says, no, that put water out of our reach.

00:20:10,849 --> 00:20:12,089

Can't buy the water again.

00:20:12,310 --> 00:20:17,069

So you have plenty of farmers now where you might start out a crop, but you can't continue to water.

00:20:17,069 --> 00:20:23,849

So although this seems like a better option for farmers, the price fluctuations of water means

00:20:23,849 --> 00:20:26,229

that it also creates certain kinds of vulnerabilities.

00:20:27,510 --> 00:20:33,329

Thirdly, I mentioned at the outset in Hounslow in particular, some farmers have access to this underground irrigation system.

00:20:33,689 --> 00:20:39,550

This would also seem to be really a good thing for farmers, reduce a lot of their vulnerability.

00:20:39,989 --> 00:20:49,849

Except the model of farming that goes along with irrigation tends to also require more inputs of fertilizer, of chemicals. These are larger fields.

00:20:50,229 --> 00:20:53,270

They often require mechanization, so you have to hire a tractor.

00:20:53,750 --> 00:20:58,310

You might have to hire laborers to help you reap the crop. So there's an expense.

00:20:58,689 --> 00:21:03,969

There's a lot of capital expense involved in the model of farming that makes use of a big irrigation

00:21:03,969 --> 00:21:07,670

system as opposed to just hand watering every individual's crop.

00:21:08,010 --> 00:21:14,089

So here's a farmer who says, chemical gone up, fertilizer gone up, and what you produce? No, it's going down.

00:21:14,390 --> 00:21:19,949

The tractor men in the plaza go, the day laborers go, you're producing a lot more, she admits.

00:21:19,969 --> 00:21:21,510

This is a female farmer, in fact.

00:21:21,910 --> 00:21:24,709

And you owe more money than before.

00:21:25,290 --> 00:21:27,189

You have to take out loans to buy this stuff.

00:21:27,250 --> 00:21:32,469

So the productivity is higher in a farm field that has this kind of irrigation, but because

00:21:32,469 --> 00:21:39,150

it requires more investment, at the end of the day, the farmer may not, in fact, be better off. So another example.

00:21:39,150 --> 00:21:42,650

The big farmer or the money farmer, him can go bigger.

00:21:43,329 --> 00:21:45,030

Or he can continue along the same track.

00:21:45,410 --> 00:21:47,449

But it affects the small farmer a lot.

00:21:47,650 --> 00:21:51,469

With the increase in fertilizer, increase in the spray material, increase in the seed.

00:21:52,630 --> 00:21:57,849

So rich, capitalized farmers can maybe take advantage of a sprinkler system like this, but small

00:21:57,849 --> 00:21:59,410

farmers have a difficult time.

00:22:00,390 --> 00:22:06,969

This divide between wealthy farmers and small farmers is even greater in the fourth kind of

00:22:06,969 --> 00:22:12,069

agricultural system that we've identified that we really want to take a look at, and this is greenhouse farming.

00:22:12,530 --> 00:22:20,130

Remember I said some farmers are making contracts with Grace Kennedy to receive their crops,

00:22:20,290 --> 00:22:22,170

and then they go into this processing facility.

00:22:22,510 --> 00:22:26,670

Most of these farmers, Grace Kennedy requires them to have a

greenhouse.

00:22:26,849 --> 00:22:27,969
And this is a new initiative.

00:22:28,130 --> 00:22:31,189
The government is providing loans for farmers to set up a greenhouse.

00:22:31,189 --> 00:22:35,030
Now, you might say, why do we need a greenhouse in Jamaica?

00:22:35,790 --> 00:22:39,829
It just allows you to very carefully control the growing conditions.

00:22:39,930 --> 00:22:43,949
It's not obviously because it gets too cold when we use greenhouses up here.

00:22:44,530 --> 00:22:47,609
But a lot of farmers are starting this kind of farming.

00:22:47,689 --> 00:22:49,250
And the government is really pushing it.

00:22:49,689 --> 00:22:53,189
So the government says, farmers need to start embracing technology.

00:22:53,489 --> 00:22:55,369
It requires a change in mindset.

00:22:55,989 --> 00:22:58,089
Farmers should view farming as a business.

00:22:59,550 --> 00:23:04,650
And here are some very interesting quotes about the kind of farming that the government wants to promote.

00:23:04,989 --> 00:23:09,890
As a nation, a government official told us, we have sold agriculture as something that is only

00:23:09,890 --> 00:23:14,550
for the marginalized, an activity that you do just to keep alive rather than create wealth.

00:23:15,349 --> 00:23:20,689
Demonstrate to a young person, he said, that you can be a farmer and drive an SUV and live up in the hills.

00:23:21,109 --> 00:23:22,969

That's a sermon in and of itself.

00:23:23,569 --> 00:23:26,150

They don't have to get their hands dirty if you have a greenhouse.

00:23:26,150 --> 00:23:31,430

These farmers are attracted to agriculture, not only from the standpoint of the sexiness, you

00:23:31,430 --> 00:23:34,290

know, in terms of the greenhouse, but also the returns.

00:23:34,930 --> 00:23:38,290

Nobody is ever repelled by money. They gravitate to it.

00:23:38,930 --> 00:23:44,589

So, in suburban Kingston, you've got wealthy lawyers and businessmen who are actually in their

00:23:44,589 --> 00:23:50,270

backyard investing capital and setting up these greenhouses, which are now beginning to compete

00:23:50,270 --> 00:23:52,469

with the small farmers in St.

00:23:52,650 --> 00:23:57,910

Elizabeth Parish, who don't have the ability to buy this greenhouse technology.

00:23:57,989 --> 00:23:58,989

You can see how this works.

00:23:59,270 --> 00:24:03,109

There's drip irrigation systems with a specific amount of fertilizer.

00:24:03,410 --> 00:24:07,550

There are computers that control the irrigation, that control fertilizer.

00:24:08,150 --> 00:24:16,089

You can get tons, I don't remember the number, but literally like tons of tomatoes out of one greenhouse crop like this. They're very, very productive.

00:24:16,609 --> 00:24:19,969

But then we're back to the glut on the market, and our farmers back in St.

00:24:20,089 --> 00:24:24,670

Elizabeth Parish have to compete with these highly capitalized farmers.

00:24:24,729 --> 00:24:31,010

So there's a real disjuncture between the so-called serious farmer that requires a business

00:24:31,010 --> 00:24:36,890

entrepreneurial mindset and a lot of capital, and the traditional small farmer who's really

00:24:36,890 --> 00:24:41,189

struggling in areas like St. Elizabeth. Last couple of comments.

00:24:41,489 --> 00:24:46,589

They come in with the idea around here, that is Grace Kennedy, but it's not to benefit farmers.

00:24:46,589 --> 00:24:50,089

These contracts, this farmer told us, only benefit Grace Kennedy.

00:24:50,489 --> 00:24:55,430

They're offering a contract, one of the lowest prices, below the belt, they would call it, in boxing.

00:24:55,829 --> 00:24:57,310

It's just not feasible for us.

00:24:57,390 --> 00:24:59,050

It can't work at farm price.

00:24:59,709 --> 00:25:04,569

It can maybe work if you have a greenhouse, but there's no way that the farmers are going to get a contract.

00:25:04,930 --> 00:25:08,869

The farmers that we're talking to are in a debt contract to be a part of this packing facility.

00:25:08,989 --> 00:25:11,949

It will be difficult for small farmers, another farmer said to us.

00:25:11,969 --> 00:25:17,130

In all things, smaller persons will also always be behind based on the fact that you don't have

00:25:17,130 --> 00:25:19,650

any capital to pump in right away.

00:25:20,550 --> 00:25:26,369

The bottom line, I think, for us is that this idea of catching a crop is not just a matter of

00:25:26,369 --> 00:25:31,329

whether it happens to rain or not, or what the market happens to be doing today, but it also

00:25:31,329 --> 00:25:36,050

has to do with these different agricultural systems and what they make possible, and in particular

00:25:36,050 --> 00:25:37,689

around the question of water.

00:25:37,810 --> 00:25:41,770

Water is going to be our focus in the next phase of this research.

00:25:41,770 --> 00:25:48,930

Just to conclude, I think we can see clearly that farmers in St.

00:25:49,069 --> 00:25:51,670

Elizabeth are experiencing this double exposure.

00:25:51,989 --> 00:25:57,569

They tell us that, yes, we both see climate change, and we see changes in our market conditions.

00:25:59,010 --> 00:26:03,729

The way that farmers respond to this is a really important dimension, which is why we want to

00:26:03,729 --> 00:26:06,829

include more interviews in our next phase of our project.

00:26:07,430 --> 00:26:12,569

There are links between climate change and market fluctuations, including this interesting notion

00:26:12,569 --> 00:26:18,209

where a hurricane might actually be perceived as a really good thing because it allows me to out-compete my fellow farmers.

00:26:18,930 --> 00:26:25,930

Lastly, this is sort of phrased in the verbiage of action network theory, but the farm level

00:26:25,930 --> 00:26:32,089

vulnerability is mediated by these different agricultural technologies, or assemblages, which

00:26:32,089 --> 00:26:35,550
allow certain kinds of things to take place.

00:26:35,849 --> 00:26:42,890
They facilitate some farmers being more successful and other farmers being quite a bit less successful. There we are.

00:26:43,109 --> 00:26:51,890
There's me, Doug, and Scott at the Appleton Rum Tour, which I highly recommend. Thank you very much.

00:26:57,310 --> 00:27:02,550
I know we're a little behind schedule, but I'm happy to entertain any questions you might have.

00:27:02,550 --> 00:27:08,369
I'd just like to say that I connect with the study that you're doing because I've seen a similar

00:27:08,369 --> 00:27:11,829
circumstance, or I've seen a situation like you've used.

00:27:13,229 --> 00:27:19,689
Small farmers are quickly becoming extinct breeders because of that double-edged sword that you're speaking about.

00:27:20,390 --> 00:27:23,430
We had a hurricane in 2010 in Great Britain.

00:27:24,630 --> 00:27:33,550
Several small farmers were interviewed, and they lost probably like two or three acres worth of crop.

00:27:34,510 --> 00:27:37,189
A large farmer, he lost like a thousand acres.

00:27:37,689 --> 00:27:39,630
The small farmer is still out of business.

00:27:40,589 --> 00:27:42,489
He did not have the comfort to start up his farm.

00:27:42,930 --> 00:27:45,189
The large farmer lost a thousand crops.

00:27:45,469 --> 00:27:48,010
He's still there with more acres of land.

00:27:50,430 --> 00:27:53,430
So it happens in the hurricane.

00:27:53,430 --> 00:28:01,530

You might say, the government seems to be almost saying, well, maybe that's okay because the

00:28:01,530 --> 00:28:02,709

big farmer can take over.

00:28:02,890 --> 00:28:10,069

Maybe we don't need all these inefficient small farms, and we'll just let the big, capitalized, serious farmers take over.

00:28:10,229 --> 00:28:12,050

But then what happens to those people?

00:28:12,189 --> 00:28:15,329

Again, this goes back to the rural-urban migration question.

00:28:16,430 --> 00:28:21,790

Rural livelihoods in the Caribbean and other places in the Global South are important for other

00:28:21,790 --> 00:28:24,310

reasons than just output per acre.

00:28:24,949 --> 00:28:31,430

If you say to everybody, you have no livelihood in the rural sector, you're going to provide

00:28:31,430 --> 00:28:38,410

jobs for those people in the big capital city, which already, Kingston has more than a third of the population. There's no small farming.

00:28:38,930 --> 00:28:41,349

It was a real life helping people.

00:28:41,949 --> 00:28:47,170

Now the small farmers concede, and they have to settle down. That's what I've seen.

00:28:47,170 --> 00:28:50,709

So there's a whole set of social problems that emerges from that.

00:28:51,250 --> 00:28:55,630

Unemployment goes up in the urban areas, and the growth of informal settlements.

00:28:56,569 --> 00:28:58,729

That becomes a real challenge.

00:28:58,869 --> 00:29:03,130

I think from a policy perspective, you're much better off providing a way for small farmers

00:29:03,130 --> 00:29:03,890

to stay on the land.

00:29:03,949 --> 00:29:06,270

These farmers want to be on the land. They love their farming.

00:29:06,869 --> 00:29:08,250

I love my farming men.

00:29:08,290 --> 00:29:10,290

I remember this guy very clearly telling me this.

00:29:11,069 --> 00:29:14,089

This one guy said, they just get painstaking.

00:29:14,089 --> 00:29:20,089

He said, oh, I planted a proper cabbage. It was lush, man. It was green, man.

00:29:20,089 --> 00:29:22,089

And then the rain just came and took it all away.

00:29:22,670 --> 00:29:28,050

And it was, I mean, you could just feel, it wasn't just he was saying, I lost the money I invested in.

00:29:28,069 --> 00:29:30,449

It was like, my cabbages are gone.

00:29:30,530 --> 00:29:34,089

And it just was, there's something really important about that.

00:29:34,109 --> 00:29:38,109

And I think we need to find ways of letting those farmers remain viable.

00:29:39,050 --> 00:29:43,130

Are there any efforts for organic farming?

00:29:43,489 --> 00:29:45,390

Is there any time to change?

00:29:45,390 --> 00:29:47,589

There is very interesting, yeah.

00:29:48,469 --> 00:29:53,729

From a consumer perspective, I don't think there's a widespread understanding about organics

00:29:53,729 --> 00:29:55,949
among a typical Jamaican consumer.

00:29:56,589 --> 00:29:58,910
And this is mostly domestic crops.

00:29:59,449 --> 00:30:05,709
But there's one champion in particular up in Potsdam has a big farm growing all kinds of organic things.

00:30:05,709 --> 00:30:12,589
Organic herbs, he had like cilantro and basil and purple ruffles basil and showing all these

00:30:12,589 --> 00:30:14,430
different, purple broccoli he was growing.

00:30:14,689 --> 00:30:20,010
Some of this he was marketing to high-end hotels who could use, like, we serve organic meals

00:30:20,010 --> 00:30:22,709
in our restaurant as a way to get tourists.

00:30:22,829 --> 00:30:29,109
That's actually a separate, very interesting issue is the links between these agricultural areas

00:30:29,109 --> 00:30:31,069
and the tourist sector up on the North Coast.

00:30:31,329 --> 00:30:34,069
There are not as many links as you might think.

00:30:34,069 --> 00:30:39,750
A lot of the stuff that ends up in the hotels is being imported rather than being shipped, you

00:30:39,750 --> 00:30:42,089
know, an hour away in St. Elizabeth Parish.

00:30:43,510 --> 00:30:49,609
Outside market, there would be maybe local people they don't understand organic, the advantage

00:30:49,609 --> 00:30:52,609
of organic production yet in the market.

00:30:53,489 --> 00:30:58,849

Outside the local, regional, and international market, that to me might be a problem.

00:30:58,869 --> 00:31:00,270

This guy's really pushing it.

00:31:00,270 --> 00:31:06,170

There's a little resort town called Treasure Beach which is a little bit sort of like a funky

00:31:06,170 --> 00:31:08,410

version of like Montego Bay.

00:31:08,530 --> 00:31:10,810

It's not kind of big mass tourism. It's more local.

00:31:11,089 --> 00:31:15,010

There are some local people, restaurateurs that are really pushing organics.

00:31:15,170 --> 00:31:17,910

There's a little market that sells organic produce.

00:31:18,709 --> 00:31:21,469

It's a very small scale at the moment from what I can see.

00:31:21,709 --> 00:31:23,229

But I think there's a potential there.

00:31:23,229 --> 00:31:25,189

This one farmer is a real champion.

00:31:25,290 --> 00:31:26,489

He really believes in it.

00:31:26,550 --> 00:31:31,969

He's sure that the Jamaican public will pay a little bit more for produce that's organic because

00:31:31,969 --> 00:31:33,430

he can convince them that it's safe.

00:31:33,510 --> 00:31:34,430

It's not full of chemicals.

00:31:34,689 --> 00:31:35,550

It's better for the environment.

00:31:35,790 --> 00:31:41,890

And I think as you say, organic farming is also a little bit more resilient in the face of fluctuating

00:31:41,890 --> 00:31:47,349

weather conditions because you're not so reliant on the inputs of fertilizer, the inputs of water.

00:31:47,709 --> 00:31:50,810

You're using mulching and other kinds of organic techniques.

00:31:51,170 --> 00:31:55,130

It's a really good style of farming in variable weather conditions.

00:31:55,410 --> 00:31:57,189

So it'll be interesting to see how that progresses.

00:31:59,750 --> 00:32:05,630

What about building some resources together with the farmers?

00:32:05,770 --> 00:32:09,050

They seem really, they're kind of competitors to each other.

00:32:09,829 --> 00:32:15,449

So I'm wondering if they were open to having like farmer meetings or kind of working together.

00:32:15,650 --> 00:32:17,410

It's a really good question.

00:32:17,569 --> 00:32:18,650

I think it's a crucial question.

00:32:18,829 --> 00:32:20,750

It's one that I'm very interested in.

00:32:20,770 --> 00:32:27,869

My work from Mexico, which is more about migration but also had to do with farming, there's

00:32:27,869 --> 00:32:30,250

much more collective farming going on.

00:32:30,550 --> 00:32:34,290

And part of my argument was that that collective farming was a good thing and helped to mitigate

00:32:34,290 --> 00:32:36,489

the need for people to migrate to the US.

00:32:36,810 --> 00:32:39,170

In Jamaica, the farming seems to be very individualistic.

00:32:40,189 --> 00:32:43,209

Back in the 70s, Michael Manley was prime minister.

00:32:43,310 --> 00:32:49,390

They basically had a socialist government and they set up these big government food farms, they were called. They worked cooperatively.

00:32:50,630 --> 00:32:55,650

And farmers were collectivists and they were basically working for the government.

00:32:55,650 --> 00:32:59,930

But they weren't very successful. They weren't very productive.

00:33:00,489 --> 00:33:05,410

And the government is trying to get farmers to establish these associations and work together,

00:33:05,469 --> 00:33:09,410

if nothing else, as I said before, so that everybody doesn't grow peppers at the same time.

00:33:10,709 --> 00:33:14,270

So I think it's something that we're going to try to ask farmers about more.

00:33:14,349 --> 00:33:19,109

There seems to be something about the farming culture in this part of Jamaica, at least, that

00:33:19,109 --> 00:33:21,109

goes a little bit against working together.

00:33:21,390 --> 00:33:31,050

From my sort of theoretical and political perspective, I think working cooperatively is really the answer.

00:33:31,229 --> 00:33:34,569

I think this is where they kind of need to go in order to...

00:33:35,349 --> 00:33:38,530

I mean, if farmers band together, they could maybe buy a truck and share the truck and then

00:33:38,530 --> 00:33:40,989

they're not dependent on the ablers, just as one example.

00:33:41,750 --> 00:33:44,550

So it's something that I'm going to pay a lot of attention to.

00:33:49,130 --> 00:33:49,609

Thank you.