Center for Strategic and International Studies

Online Event

"[re]GENERATION: Nurturing Climate Resilience Around the World"

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FEATURING:
Senator Bob Casey,
U.S. Senate (D-PA)

Annalise Blum,
AAAS Science & Technology Policy Fellow, Stabilization and Peacekeeping Operations, Office of the Under Secretary of Defense-Policy

Chet Tamang,
Program Director, MRED-II, Mercy Corps

CSIS EXPERTS:
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Caitlin Welsh: Hello, and welcome to today's public event celebrating this summer's release of the CSIS docu-series [re]GENERATION. The documentaries in this series show how farmers around the world are adapting to a changing climate using simple nature-based techniques.

These mini documentaries are brief and beautiful and poignant, and they're the culmination of over a year's work by the CSIS Global Food Security Program under the directorship of Kimberly Flowers, my predecessor, led by Christian Man, who you'll hear from soon, with the extraordinarily talented CSIS Ideas Lab, and with our partners in El Salvador, Kenya, and Nepal, including the Africa Sand Dam Foundation, Catholic Relief Services, Mercy Corps, and many others.

As the documentaries show, when farmers apply these simple techniques, they can keep their agricultural livelihoods, earn or even increase their incomes, and improve their food security. But adaptation to climate change is only one solution to a very complex problem set, and in many places around the world what we're seeing is that climate change is threatening livelihoods, forcing families who are engaged in livestock and crop production, fishing and forestry, to abandon their work in search of other employment.

They might come under the influence of terrorist organizations who prey on their vulnerability. They may migrate to cities where employment is scarce. They may migrate to other countries, joining the ranks of the almost 1 billion migrants around the world today. Adaptation to climate change is, as I said, one of many solutions to these complex problems and it's the focus of our event today.

I'm honored to have with us not only an expert panel but a political champion, Senator Robert Casey, Jr., of Pennsylvania. Senator Casey is a good friend of CSIS's Global Food Security Program. He last joined our program a year ago this month to deliver a keynote address on food security, climate change, and political stability in Africa.

But the senator's engagement with CSIS on food security dates back more than a decade. In 2008, Senator Casey co-chaired, with the late Senator Lugar, a CSIS task force assessing the 2007 and 2008 global food crisis and how to respond to it. That task force produced a report and that report's findings became the basis of the Global Food Security Act, first introduced by Senators Casey and Lugar in 2008.

The Global Food Security Act was finally passed and signed into law in 2016 and was reauthorized in 2018, spearheaded by Senator Casey in both instances. The Global Food Security Act was informed by the '07-'08 food crisis, and today, of course, we're experiencing a food security crisis of a wholly different nature around the world and in the United States. In response to the Covid-19 pandemic, Senator Casey acted early and often to improve food security among Pennsylvanians and Americans around the country, understanding that leadership at home strengthens our leadership abroad.

Senator Casey, we're honored to have you with us today. The floor is yours; the virtual floor, of course.

Senator Robert Casey (D-PA): Well, Caitlin, thank you very much. I want to thank you and CSIS for this opportunity. And it's always great to see a fellow Pennsylvanian taking a leadership role in such critical issues to our country and for the world.

For me, as you indicated in your introduction, I've been engaged in food-security issues now for about a decade. But increasingly I'm alarmed at how climate change is impacting efforts to end poverty around the world. We know that climate change and food security are inextricably linked, and climate events are increasingly impacting crop yields, biodiversity and water supplies, primarily impacting those who can least afford to withstand such disruptions.

So as we mark the 10th anniversary of USAID's Feed the Future program – it just happens to be this month – U.S. government investment in global food security should reflect the linkage, the basic linkage that I outlined, and ensure that we're tailoring our development interventions to ensure climate-change adaptation and mitigation, that both adaptation and mitigation measures are, in fact, built in. Climate change is resulting in irregular rainfall, manifested in forms of drought, extreme flooding and soil erosion. This leads, of course, to food insecurity, which leads to both displacement and migration.

CSIS's [re]GENERATION docuseries highlights how nature-based interventions can help farmers adapt to climate change and continue the critical work of enhancing livelihoods and reducing poverty across the world.

Here are some examples of the interventions that include USAID-funded projects that work with local communities to do the following, just by way of example. Number one, recharge aquifers or building sand dams in Kenya to ensure rivers are full of clean filtered water and accessible to small-holder farms. Number two, restore biodiversity. In El Salvador, USAID-supported projects are educating farmers on agro-forestry, restoring soil health and biodiversity, reclaiming a rich history in cacao production, and providing farming communities access to income and preventing migration to the United States. Number three, reverse erosion. In Nepal, the U.S. government is funding projects that support simple construction on rivers to redirect rainwater and prevent erosion by rivers.

Now, while these interventions have been successful, the Covid-19 pandemic has revealed just how vulnerable our global food systems are right now. And climate change is only going to exacerbate, terribly exacerbate, this problem. This crisis, of course, is different than the 2007-2008 food crisis. That was partially due to drought in grain-producing countries. We now know that Covid-19 is demonstrating how food supply chains are susceptible to disruption from top to bottom.

Looking ahead, we must take lessons learned from the Covid-19 pandemic and apply them to shore up food systems to adapt to and to mitigate the efforts – or the effects, I should say – of climate change.

Today's discussion with our expert panelists, Annalise Blum, Christian Man, who also has some Pennsylvania roots as a Penn State graduate, and Chet Tamang will build on [re]GENERATION's findings and help the United States policymakers chart the path forward on ensuring that sustainable, climate-smart agricultural policies are implemented in the years ahead. All of that is not – is easier to say than do.

But that's why I continue to advocate for robust funding for food security, not just in the context of Covid-19, but looking ahead beyond the pandemic and leveraging programs like USAID's Feed the Future program, as well as partnerships with organizations like Mercy Corps, Catholic Relief Services and others, to achieve our goal of ending global poverty.

Thanks very much.

Caitlin Welsh: Senator, thank you again for joining us this morning.

The documentaries that we're here celebrating talk about climate change adaptation in El Salvador, Kenya, and Nepal. These are farmers adapting to the effects of climate change in these countries around the world. For the United States, what's our strategic interest in these issues?

Sen. Robert Casey: Well, Caitlin, I'd start with the basic premise that I think we all share; that climate adaptation, in order to advance food security is critical to our national security interests. We know, as far back as – and probably before – but the one that I think got a lot of people's attention was the 2014 – hard to believe it's that many years ago now – the 2014 Worldwide Threat Assessment by our intelligence community reported the following, "Lack of adequate food will be a destabilizing factor in countries important to U.S. national security."

So, we've seen how, in places like Syria, and Nigeria, and other places, how environmental stress and high food prices have led to political instability that ultimately implicates our national security interests. Just recently, in July, The New York Times magazine report on climate migration notes as follows: "drought helped push many Syrians into cities before the war, worsening tensions and leading to rising discontent. Crop losses led to unemployment that stoked Arab Spring uprisings in Egypt and Libya."

So, we're all aware of the national security challenges presented by the war in Syria, and we're also aware of the turmoil that followed the Arab Spring. If we can find a way to mitigate the impact of climate change and help communities adapt, we'll be helping prevent the type of instability that leads to costly U.S. engagement overseas. So, again, we've got a lot of work to do on this, but I think we can have an impact.

Caitlin Welsh: Great. Thank you.

And Senator, what's your own personal interest in this issue?

Sen. Robert Casey: I think on food security, I guess it goes back to the way I was raised. I have to note my parents' impact as well as I had the good fortune, when I was a young student, both in grade school, and in high school, and in college actually, to be educated first by IHM nuns, who were great educators and strict disciplinarians, but also the Jesuits. And all of those individuals, in one way or another – my parents, the great sisters, and the Jesuit priests – they constantly imparted to us the obligation of our faith and that, if you're going to be in a world where people are hungry, you should be summoned by your faith or at least by your conscience to help those who are hungry; that you have to take action in a world of suffering. You can't just practice your faith, and go to church, and pray; you have to take action.

So I guess that's the predicate for what happened years later as a public official, and ultimately in the Senate, where Dick Lugar – a veteran member of the Senate, and a veteran member of the Senate Foreign Relations Committee, and at one time its chairman – came to me as a – kind of an almost rookie senator, and asked if I would work with him on what was then the early stages of that legislation on the Global Food Security Act. And I have to commend and salute his early efforts all those years ago to do this work.

After Dick Lugar left the Senate, I worked for a period of time – a short period of time with Senator Mike Johanns from the state of Nebraska, and then ultimately with Senator Johnny Isakson from the state of Georgia, to further the efforts of the Feed the Future program. We finally got legislation passed to codify it.

It's increasingly clear to me – and I think to so many – that food security is inextricably linked to climate change, and that U.S. government-funded programming has to reflect that basic linkage. So, I'm particularly glad and encouraged that CSIS and other organizations are furthering research on those linkages.

Caitlin Welsh: Yeah. Absolutely. Thank you.

And how do you think the United States government should continue to lead on this issue globally?

Sen. Robert Casey: Well, certainly USAID's Feed the Future Program is essential to this, and so many other efforts that we've tried to undertake in the U.S. government. But this pandemic has made not just our lives domestically more difficult – accelerating food insecurity in our own country and creating all kinds of trauma for families, and children, and vulnerable Americans – but of course the pandemic has made it that much more challenging globally.

And that impact and that trauma cannot be overstated. As I mentioned earlier, the 2007-2008 crisis was driven by drought and a rise in oil prices. That resulted in food shortages and also price fights. In this case, this pandemic has shown how vulnerable the entire food supply is, and how vulnerable it is to shocks. First and foremost, I think Feed the Future and other organizations adapting to Covid-19 in a number of ways is important to mention.

Supporting governments to create and adapt smart policies that bolster food security, nutrition, and markets is important. A second, providing financing for farmers and businesses, particularly those that are run by women. Third, by stabilizing local food prices and supplies by helping farmer get access to seeds and to inputs. Here's the challenge, though, here at home in terms of policy: Although Congress appropriated over $600 million for humanitarian relief related to the virus and the pandemic, I worry that once the pandemic dies down and the virus is a little bit in the rearview mirror, the focus on shoring up food systems will erode. So, I'm going to continue to make sure that U.S. global food security efforts not only integrate climate change adaptation but also the strengthening of the food supply system itself.

Caitlin Welsh: OK, thank you. And it's so important to note that the nature of today's crisis, again, is so very different from the last crisis. And, you know, as I was doing my own research, was just so pleased to see your own signature on our very early efforts to address

global food security. Again, that was actually 12 years ago right now. And please and not at all surprised to see your leadership addressing food insecurity right here at home. So, thank you so much for your leadership. We would love to welcome you back, hopefully in person, but if not – if not, again virtually. So again, thank you so much for your time, Senator.

Sen. Robert Casey: Thank you.

Caitlin Welsh: Our next guest – we'll turn now to Dr. Annalise Blum. She is an AAAS science and technology fellow in the Stabilization and Peacekeeping Operations Office of the Undersecretary of Defense for Policy.

Annalise Blum: Thanks so much, Caitlin. I'm really delighted to be part of the event today.

Caitlin Welsh: I think I'm having a little bit of technical difficulties on my end, so one quick second. Annalise, just want to start out – sorry for that technical glitch – but wanted to mention as well that your research is – previously – your current work is on stabilization, prevention of conflict, and environmental security. And previously you researched many issues related to water security in the United States and also in Ethiopia, Kenya. Tanzania, Thailand, and Ecuador. So again, Annalise, thank you so much for joining us today.

And the first question I'd like to ask you is – again, your background is in water issues, and right now you're placed within the office of an undersecretary in the Department of Defense. Can you help paint a really big picture of how – of environmental change as it relates to all these phenomena? Water security, food security, human migration, instability, et cetera? So worldwide, what trends are you observing?

Annalise Blum: Sure, yeah. So, as a hydrologist that's studied changes in water resources, and in particular how – (inaudible) – are changing and the impacts of these changes on ecological systems, and I'm really worried about how rainfall patterns are shifting, and weather is becoming more unpredictable. That leads to water insecurity potentially, but also has huge implications for both food and energy security.

And, yeah, so in some places we're seeing more frequent or intense floods, sometimes in different places or the same place. There's also increased risk of drought. We're confronting more frequent storms, like ones we've recently experienced in the United States. And then rising sea levels threaten coastal cities, and they also can impair water resources and agricultural lands with salt contamination.

Caitlin Welsh: OK, thanks. And can – just a few examples of specific places where you've observed these things?

Annalise Blum: Yeah. So, one example that's often mentioned is Lake Chad, which went through a period of shrinking previously, and it shrunk to about a tenth of its original size. And that made fresh water and fish scarce. And there's evidence to suggest that Boko Haram was able to leverage the livelihood insecurity that resulted from these shifts to recruit new members.

Caitlin Welsh: OK. Thank you. And then – so to your current role – you've researched these issues

as a researcher, but in your current role, why do you think it's important for the national-security and defense communities to be concerned about these issues?

Annalise Blum: Yeah. They're really important. We're seeing how these changes to the environment are intensifying competition for scarce natural resources, fresh water and arable land in particular. And the Covid pandemic has shown us how extreme events or other environmental stressors can exceed a state's capacity to respond. And so, when this happens, the stressors can accelerate fragility, instability, or even risk of conflict. And that in turn threatens human and international security, as the senator talked about.

In my role as an AAAS science and technology policy fellow supporting the Office of Stability and Humanitarian Affairs, I contribute to work on stabilization to try to address some of these challenges. And that's under this framework of defense support to stabilization.

Caitlin Welsh: OK, great. And then, based on your work in your current role, what do you think are some threats and opportunities for food security today?

Annalise Blum: Yeah. So, threats to food security are growing, and unfortunately, they're likely to contribute to instability, which then in turn can further exacerbate food insecurity. So, it can be a vicious cycle.

As a hydrologist, I worry first, as I mentioned before, about changes in water availability and risk of extreme events which can contribute to crop failures, as I did research in Kenya on water access and heard from people there about how their wells were drying up. We're also seeing this locust outbreak in East Africa that's decimating crops. And then for populations that rely on fish, we're seeing fisheries being depleted or at risk of collapse, and so worried about how these sorts of threats people are facing today are likely to get worse, and the links to fragility and instability potentially if it exceeds states' capacity to respond.

Caitlin Welsh: OK. OK, good. Thank you. Again, I was having a few technical difficulties on my end, so I might have skipped a question or missed an answer on your side. But is there anything else you'd like to share with our audience about the issues that you've researched in the past or the things you're working on today?

Annalise Blum: Sure, yeah. So, I guess, in my current role, I'm trying to help support our national-defense priorities. And so, I think an important link to talk about is the ways that I think some of these things contribute to addressing – to achieving our national-defense priorities in terms of the National Defense Strategy. The most recent one from 2018 identified the reemergence of long-term strategic competition as the central challenge to U.S. prosperity and security.

And I think that, to ensure the United States is prepared to compete, it's important that we understand and prepare for how these challenges – resource competition, food security, environmental security, water security – affect regional stability and national security. And what we're finding is it seems environmental factors can impact strategic, operational and tactical landscapes. It can challenge combatant commands' freedom to operate within their areas of responsibility.

We're also worried about how environmental factors and stressors can influence and

challenge the capabilities of our partners and allies, not just us. For example, if they're responding to more frequent natural disasters, they might have reduced capacity to support joint efforts in other areas such as facing threats of violent extremist organizations. So, I think promoting food security, environmental security, water security, can help us strengthen our alliances, attract new partners, which is one of our lines of effort in the National Defense Strategy.

And, yeah, I guess just to kind of wrap it up, I get like – it seems like we're learning from the Covid-19 pandemic that a crisis that seems unrelated can have devastating impacts on food security by disrupting supply chains. And I think I worry about extreme events, like floods, that might impact not just the production of food, but also distribution and transportation infrastructure. So, I think there are some things that we can start doing now to prepare for these challenges and having events like these to talk about them – this docuseries – making sure we understand these risks is really the first step to being able to address them.

Caitlin Welsh: Yeah, thank you, Annalise. Thanks for painting that picture of how all of these global phenomena are affecting our defense and development efforts, and also our security at home and abroad. So, thank you for joining us. That was really, really helpful.

I'm going to turn right now to our second panelist, who is Dr. Christian Man. He is deputy coordinator for the Just Rural Transition Policy Action Coalition. And he is a non-resident fellow with the CSIS Global Food Security Program, but while he was a resident fellow, not long ago, he spearheaded the entire Regeneration series from idea to the beautiful documentaries I hope you've all had a chance to watch. So, Christian, thank you for joining us. Welcome and kudos.

Christian Man: Thanks, Caitlin. Great to be here.

Caitlin Welsh: First question for you is, this documentary series focuses on climate change adaptation and not climate change mitigation. So again, this whole series was your idea. Why did you decide to focus on adaptation and not mitigation?

Christian Man: You know, it's a good question, and I think oftentimes we're tempted to pit mitigation versus adaptation. And, you know, I think our perspective was that it's really a both/and; not an either/or issue. But from an adaptation perspective, it's really about justice. I mean, if you think about countries like El Salvador or Nepal, countries where farmers are highly vulnerable to climate change and yet have done do little to contribute to the problem from a carbon emissions perspective, there is sort of a paradoxical sort of issue of justice there, and it makes – it only makes sense to help farmers who are sort of downstream of these sort of volatile challenges that Dr. Bloom pointed out so nicely.

And, you know, we really think that, you know, on issues like – I think it was Caitlin that said at the beginning, you know, if the viability of agricultural livelihoods are eroding and farmers are forced to consider outmigration either to local or tertiary cities, or abroad, you know, I think my perspective is we're somewhat agnostic about migration – we're not saying migration is intrinsically bad. What we are saying is we want to return to farmers the kind of agency that lets them choose whether or not they stay, or they go. So, this is just a couple of reasons we decided to focus on adaptation.

Caitlin Welsh: Yeah. Yeah, thanks for clarifying that for our audience – not saying that migration is a bad thing, but just want people to have the choice for where to reside and earn their livelihoods, and also for clarifying that adaptation is not simply admitting that climate change is here to stay, and we can't do anything about it.

Christian Man: Right.

Caitlin Welsh: Mitigation efforts are obviously incredibly important, too.

Christian Man: Exactly.

Caitlin Welsh: So as executive producer, you are I think the only person who was on the ground at the filming of each of the documentaries, on location in El Salvador, Kenya, and Nepal. We've seen the documentaries; they are very impactful. Can you tell us what it was like to be there for the filming of these?

Christian Man: Yeah, thanks. You know, I thought I would just sort of paint two brief pictures to help us appreciate the amazing accomplishments that these different technologies we looked at capable of.

You know, to be vulnerable is to experience – psychologically and economically, and politically – a feeling of helplessness. And that's certainly true with the climate change. The enormity and sort of the diffuse nature of these forces are such that farmers feel, look, I invested all my money in a crop of maize or what have you, and overnight it was swept away.

You know, so you think about that kind of helplessness – when we were in Nepal, we were looking at one of these sort of sand banks that had been – that had reemerged because of the bioengineering structures that help slow the flow of water and cause a deposition of sand, gradually expanding these river banks. So I took my shoes off and socks off because I just wanted to feel what the bank was like, and I walked out on there, and, you know, when a person – you know, a farmer, such as those we talked with in Nepal can see for themselves, I did this, I'm capable, working with my neighbors, of reclaiming this land, it's extremely powerful, because it – not only for practical reasons, but I think it helps return to them a sense of, you know, we're not helpless victims in this process of climate change. We're agents in it, and we can actually harness the forces of nature to work in our benefit.

Something similar in Kenya, where we looked at these sand dams, these structures that literally dam sand rather than water and cause an accumulation of water beneath its surface. This one sand dam we walked out onto, it's hard to describe how powerful it was, because we're in a part of Kenya that's extremely arid. And in this small, little area where we were, there was banana trees growing along the edge of the water. There were small gardens everywhere. There was so much birdsong that it was almost hard to hear yourself think.

And, look, I'm not romanticizing the problems. They're still there. They're still real. But when you see that kind of flourishing from an environmental perspective, it's just powerful. And I think it helps suggest that, look, these sorts of transformations are not just sort of sentimental abstractions. They're tangible – they're tangible transformations that make a real difference in the lives of farmers; so just a couple of illustrations.

Caitlin Welsh: Yeah. Thank you, Christian. Across the three documentaries, what lesson or lessons would you like viewers to take?

Christian Man: Yeah. Good question. You know, I think when we look at the future of large-scale adaption in the agricultural sector – so rather than just project by project – when we look across entire landscapes, across entire regions, to me and to our team, what we see is a future where these low-cost, durable, inventive, nature-based solutions are working at a very broad level simply because they are durable and low-cost. They don't look sexy. When you see them, you don't think, wow, this is some shiny, gleamy thing. But they are powerful, and they can be environmentally transformative.

So I think what – I would encourage everyone here to take a look at the videos and think about what it would be like if an entire portion of Kenya or an entire portion of East Africa was filled with these structures – sand dams, for example – how powerful that could be for helping return to farmers that sense of agency that stabilizes agricultural livelihoods, lets them decide whether to leave or to stay. So, I think that's maybe how I'd sum that up.

Caitlin Welsh: Good. Well, thank you. And your work helps us envision what that might be like. So, again, thank you for all of your work. And kudos on the finalization of a really excellent series.

Christian Man: Thanks, Caitlin. And, you know, I just want to give a shout out to Yumi Araki, our super-talented and fantastic director, whose creative vision really kind of led the process. So Yumi, if you're out there, great job. It was awesome to work with you.

Caitlin Welsh: Thank you, Christian. And thank you, Yumi.

Now I'd like to turn to our next panelist, who's Chet Tamang. Chet joins us from Nepal today. He is a program manager with Mercy Corps, where he manages the Managing Risk through Economic Development Program. He has over a decade of experience in international-development work. And again, he's joining us from Nepal. So, Chet, it's evening your time. Thank you again for making time to be with us.

And the first question – thank you, Chet. The first question I'd like to start out with for you, Chet, is can you describe for us how is climate change affecting Nepal? What are you seeing on the ground?

I think you're on mute. I think we might be having some technical difficulties right now.

Chet Tamang: Hello.

Caitlin Welsh: Great. Hi, Chet. Great to have you with us.

Chet Tamang: Hello.

Caitlin Welsh: No problem. Great to have you with us. And I'll repeat the question. How are you seeing climate change affecting Nepal right now?

Chet Tamang: Thanks, Caitlin, for having me here. So, when we talk about Nepal, the first thing that comes is Himalaya, and we know that it's melting. And Nepal is also known for its snow peaks and the biodiversity. Both of them are at risk due to the climate change. And this is also a country where 80 percent of people's livelihood depends on the agriculture. And at a quarter of GDP is contributed by remittance. And there is a strong relationship between the climate change, agriculture, and the remittance that's coming into the country.

Himalaya is a source of water for water for agriculture, since the key resource for livelihood is also affected by climate change. People have to find the alternative – alternatives to agriculture, yeah? And as a result, they leave to countries in the Middle East, or East Asia in search of alternative livelihoods. Although this has increased the remittance, this has significantly affected the workforce available for the agriculture sector in Nepal. This has impacted the growth and the prosperity that aspire to agriculture in Nepal.

Those who are left behind, they're still continuing their agriculture, but they don't have enough knowledge, skill, and resources to cope with the changing seasons or rainfall patterns. And there is also an increase in magnitude and frequency of climate-related disaster. It's hard to predict what will occur and when. But there are new type of climate events and diseases that rural farmers have never seen before, which are directly affecting their agriculture. It's hard to find farmer, like, who are really motivated, and who sees agriculture leading to the prosperity, due to the unpredictability and uncertainty due to climate change.

Caitlin Welsh: OK, thank you. Thank you, Chet. A variety of impacts of climate change on Nepal, and also on agriculture in Nepal. So, thank you for that. Your work right now is helping farmers to adapt to climate change in Nepal. Can you give us an overview of the work that you're doing?

Chet Tamang: Sure. So, the program that we work is called Managing Risk Through Economic Development, or in short MRED. And we – and this program works with the most vulnerable population in the farthest part of Nepal, which is very close to border between India, and where the farmers get affected every year by flood. And when there is a flood, what it does is either it erodes or cuts their agricultural land, or it just brings and deposits a huge amount of sand and silt in their agricultural land, making it enormously difficult to do any agricultural activities.

And since their livelihood is primarily dependent on the livelihood, the agricultural lands are normal and valuable option to maintain their life, many households, they go to India in search of job. And most of the time it is the male member who leaves from households, and leaving behind their spouse, kids, or elderly people who are even more vulnerable to different type of shock and stresses. And to tackle this problem we – under this program called MRED, we promoted this climate resilient livelihood strategies, coupled with the disaster risk reduction strategies.

And we want to develop a more sustainable and replicable model with the integration of disaster risk reduction and climate change. And the disaster risk reduction strategies ensures that the household and community have the ability to prepare and respond to disaster. Such as, we build and train the team of first responder, build skills like the first aid, search and rescue, that help individuals who are at risk during the disasters, to save their lives. Or by providing these early

warning systems, so that people can evacuate well in advance, and they can save their lives or even their property as well.

Caitlin Welsh: OK, that's interesting. Yes, go ahead, Chet.

Chet Tamang: And as a climate resilient strategy, we promote this localist bioengineering techniques to prevent the reoccurring problems, combined with this agriculture techniques that can simultaneously address the climate-related risk, but also generate the income. We call it nexus approach. For example, planting sugarcane along the riverbank that are covered by sand or silt. And this creates the barrier for flood, preventing further problems. And since the sugarcane slows down the river current, causing finer clay particles to settle in the riverbank, sugarcane also contribute to change the soil texture, making it suitable for other crops as well.

The sugarcane is planted in combination with this localist bioengineering structure. And it is – we have found it to be very effective to reclaim the land and helping farmers to go back to the type of agriculture that they used to do, like, 10 years before. And yeah we work not only with the farmers, but we work with the – along with promoting the sugarcane – we work with a whole range of market system actor to make sure that the farmers have a good connections with this market, so that they can sell the production that they have.

Caitlin Welsh: OK, thank you so much, Chet. And my last question for you is: What do you think has to happen for these techniques to be adopted on a larger scale? Are there any – you know, one, or two, or three things that you think would have impact on a large scale?

Chet Tamang: Sure, yeah. We have developed this idea, we have piloted it, but I think one of the concern has become the financing so that these techniques can be adopted at a larger scale. And I would like to focus this point at two different financial – more specific, like, to Nepal also, but I think that applies to other part of the world as well. One is that this government has their own development plan process, like in Nepal. There is this annual development planning process that happens every year. But how can we integrate this climate change adaptation, these technologies that we are piloting, into those government plans so that it gets funded regularly and there is opportunity for scale up?

But in order to do that, there is also need of access to climate information. There are various climate change projection datas available from different models, but how can we scale it down at the local level in simple language so that the government or the farmer can use it to develop their strategies to adapt to the current changing or prepare for the potential changes? And the second way of getting this financing to be, you know, working with the financial situations, I want to give you an example from Nepal. The central bank of Nepal adopted this program called priority sector lending program, which mandates bank and financial institutions to allocate 10 percent of their loan portfolio to agriculture sector.

But banks are hardly achieving this target. And whatever investment has happened, and there is a large opportunity to make it more climate smart. And also, there is a very limited access to financial service in rural areas. Private banks and these companies are very risk averse. And so, if we can develop appropriate financial program and combine that with the crop insurance, that would really help to scale it up. But in case of Nepal, the crop insurance is also at the very early stage, so more

work has to be done.

Caitlin Welsh: Good. Thank you so much, Chet.

I want to turn to some questions from our audience before we wrap it up. And looking at just a few questions we've gotten so far. Glad that we could drill down on what climate change and climate change adaptation looks like in Nepal. So again, Chet, thank you for that. We did receive a question about another part of the world. And this question is: How will worsening water insecurity in places like Mexico and in Central and South America affect climate migration to the United States?

Christian, I know that the program did a focus on this through a journalism program last year. Do you have some information to share about migration from Central America to the United States?

Christian Man: Sure, Caitlin. And I suspect Dr. Blum could weigh in as well. But I mean, I think in general we know that water insecurity is a driver, it's a push factor in out-migration. And if you're – not to overthink it if you're trying to – or, oversimplify it – if you're trying to grow crops that are predominantly rain fed, and you experience crop failure because of more volatile rainy seasons or overall declines in rainfall, then at some point you're going to give up because it's a bad use of time and it's a bad use of money. And I think the key thing to think about is the margins – for vulnerable smaller farmers, the margins of error are exceptionally thin. And so, if you have a failed season, it's not like you can keep doing that season to season because the income and the food you derive from your harvest is what will sustain you into the next season. So, it's a situation where even a season or two can be – can have the effect of causing a farmer to out-migrate.

Maybe Dr. Blum, did you want to add anything to that?

Annalise Blum: Yeah, I think you did a good job. I think, yeah, obviously decisions to migrate are really complicated, but environmental changes that threaten food, water, livelihood, security are expected to contribute to potentially increase migration. So yeah, I think you mostly covered it.

Caitlin Welsh: Good. Thanks to both of you. We have another question here. Again, this is building on something you and I had discussed a little bit, Christian. What would you say to people who argue that mitigation is a better focus, and a more important priority than adaptation?

Christian Man: Yeah. I would say it's the wrong question. It's not – it's not an either-or situation. In any – the science is so exceedingly clear that we need mitigation efforts alongside adaptation efforts. For policymakers, clearly the complicating factor is when there's a tradeoff, when you have to allocate dollars into a mitigation fund or an adaptation fund. I think we are seeing some initiatives in certain countries that are focused on something like regenerative agriculture, which potentially – even though scientifically unvalidated as of yet – has the potential to sequester carbon in soils while also raising yields in the near term.

Now, if it sounds too good to be true, it probably is. But on the other hand, what's not to like about a win-win scenario where we can both address short-term vulnerabilities arising from climate change, so as to help farmers adapt, while also

addressing medium-term challenges related to mitigation? So, you know, I would say that underlying questions about mitigation for adaptation, there can be something political underlying questions like that. So, I think it's good to tease out what the real question is and help make a case for a sort of a pluralistic approach to climate change.

Caitlin Welsh: Yeah. Yeah, absolutely. And one final general question before we wrap it up, and this can be for any of the panelists: What do you think are the most effective ways that the United States can help countries that are severely affected by things like climate change? So, what do you think are the one, or two, or three most important things the United States can be doing to be – to help countries that are so affected by climate change?

Perhaps, Chet, we can go to you with this question?

Chet Tamang: Hello, sorry. Sorry, could you repeat the question please, again?

Caitlin Welsh: So, in your program you're partnering with the United States to address the effects of climate change in your country. So, what do you think are the, you know, one or two most important things the United States can be doing to help countries like yours that are affected by climate change?

Chet Tamang: So, like United States, I think there are many developed countries that have contributed to this different climate finance mechanism. And one of the – in our field, like where we were, and when we talk with other peer agencies, what we have felt also is there are various donors who has contributed to these financial mechanisms. And significantly there are more international and national funds being made available to climate change adaptation, to address the gap in adaptation. And maybe as one of the major donor, I think we can push for, work for, need of a more of a localized funding to ensure that the local organizations are able to access some of this climate fund – or, access this climate finance mechanism, and the resources are going directly to the community.

Caitlin Welsh: Thank you. That's a great answer, and I think that's a great place to end this. The documentaries highlighted the work that organizations are doing at a very local level, and the excellent and very effective work these organizations are doing. And I think it's a perennial challenge about how to channel money from global donors to organizations like that, that are making a real difference on the ground. So, thanks for bringing our attention to that challenge.

And I'd like to thank everyone in our audience for joining us today. Please stay connected with us on Twitter at @CSISFood. And once again, I'd like to thank Senator Casey, our keynote speaker, for being with us today and for his leadership. I'd like to thank our expert panel, including Annalise Bloom, Christian Man, and Chet Tamang. And I'd also like to give specific thanks to the CSIS iLab Team, who worked tirelessly to produce the beautiful [re]GENERATION docu-series. And this team includes Yumi Araki, Mark Donaldson, Paul Franz, Sarah Grace, Christopher Burns, and is led by Rebecka Shirazi. Finally, I'd like to thank the CSIS Global Food Security Program team and CSIS's entire external relations team for producing today's event. Thank you.