CENTER FOR
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ECONOMICS OF DISASTER PREVENTION: MEASURING THE COSTS AND BENEFITS OF DISASTER RISK REDUCTION

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ANDREW SCHWARTZ: Could I ask everybody to take their seats? We're about to get started with this program. Thank you. Good afternoon and welcome to the Center for Strategic and International Studies.

My name is Andrew Schwartz. I am a senior vice president here at CSIS for external relations. I want to welcome all of you to the center today and to this terrific series that we are doing in partnership with Louisiana State University's Stephenson Disaster Management Institute. That's – the acronym is SDMI. Everybody knows the LSU acronym because it's LSU. We are CSIS so we're going to throw a lot of acronyms at you today.

This is an ongoing series and partnership that we have with LSU and also with the Pennington Foundation. We have the CEO of the Pennington Foundation here with us today. Lori, are you around? There's Lori Bertman right here who really helped us get this series started with her vision for a new series in Washington. This is the first of its kind that looks at disasters and emergency response in an ongoing basis.

This is something we do basically monthly and I hope all of you will be subscribed to our list so we can give you updates as to when the next series are going to be going on. I also want to say that this event and all of our series, you can find at CSIS.org, our website, if you want to see the replay and we'll have transcripts up as well. I'd like to welcome my good friend, Tom Anderson, of LSU's SDMI.

Tom is going to give you a quick update on what's going on with the flooding of the Mississippi River and how Louisiana is looking at this disaster and how the Army Corps of Engineers and the state government and the locals are addressing this issue. Many of you have seen reports on CNN and other networks where the levees are cresting.

This is serious business and we can – you know, there was the first reported death from the flood just the other day. But Tom will fill you in on what's going on up to the minute because he's been getting updated from his colleagues down south. We're actually lucky that our friends from LSU could make it up here today because many of them are back home trying to work on this crisis as we speak.

We also have a terrific panel today. Dan Runde, my colleague, is going to moderate it. And I thank all of you for coming here today. And with that, Tom, please come up and give us an update. (Applause.)

TOM ANDERSON: Good evening, everybody. Thank you, Andrew. It really is an honor to be working with CSIS on these very critical issues that we're facing in the world today. And I want to not only thank Andrew and the team at CSIS but I'd also like to thank Stacey White because she worked on this panel and just was not able to be with us this evening. But she's done a great job.

But I also want to publicly thank the leadership of Lori Bertman as well. She continues to be one of the great innovative thinkers in disaster philanthropy and she's been a great colleague and mentor. And I can't say enough how much and how important it has been with her leadership to have the success of our institute and of this series. And thank you, Lori.

I've been asked to make a very few brief remarks about the current situation in Louisiana and the ongoing Mississippi River flood. But I would be remiss not to mention how our hearts and prayers are with the people of Joplin, Missouri, at this time after their city was just ravaged by tornadoes last night, just weeks after a very similar cell of tornadoes ripped through Alabama. And in case it was missed in the deluge of news last night, tornadoes also hit Kansas and Minnesota.

As you already know from the press, the Mississippi River flood is at historic levels, not seen since the Great Flood of 1927. And many actions have been taken to mitigate and respond to this situation.

For Louisiana, the Bonnet Carré Spillway just north of New Orleans and the Morganza Spillway just north of Baton Rouge have both been managed and opened by the Army Corps of Engineers and are currently actually reducing the height of the right and actually achieving slightly better results than we had hoped for.

This is very encouraging news. I will say, though, that had these two spillways not been opened, there is absolutely no question in anyone's mind that both Baton Rouge and LSU and New Orleans would already be underwater. So to the Army Corps of Engineers we are very grateful. But there are still some significant economic challenges.

These water levels and navigational changes that happened in the river due to the changed currents as well as risk to levees by runway barges have reduced shipping and resupply for manufacturing along the Mississippi.

And on Saturday, Baton Rouge experienced a number of barges – one containing hazardous materials – hitting the Mississippi River Bridge in Baton Rouge and sinking, stopping all barge traffic on the Mississippi River and as of my being here now, it is still stopped while they try to dig those barges up out of the water.

The Bonnet Carré and the Morganza openings have also impacted fisheries and oyster beds and the salinity in the water but they're not only affecting the fisheries and manufacturing but there are also all the families and small businesses who live in the Morganza Spillway area where the Mississippi River outflow is now being directed towards Morgan City. The people and businesses have been evacuated and protective actions have been taken and continue to be taken until the river subsides back to normal levels which we hope will happen sometime in July or August.

So this is a very long-term event and in the meantime while the water is being managed, it's putting in a very lot of pressure on those levees, those precious levees all the way down the system.

But there is also a critical cultural impact that I just want to draw your attention to very briefly and that's that this Morganza Spillway and the water heading down towards Morgan City is at the very heart of Cajun Country in Louisiana which is already still reeling from the BP oil spill and from Katrina.

But I'm very proud to report that in response to this flood, Louisiana has activated its highly innovative and brand new business emergency operations center housed at the SDMI disaster lab at LSU along with our partners in the governor's office of homeland security and the department of economic development at the University of Louisiana Lafayette.

This business EOC just to explain it very briefly and why it's so innovative is a gathering of all the trade association leadership from the state, from oil and gas and manufacturing to bankers, restaurants and retail stores.

And on Friday there was a briefing directly from the Army Corps of Engineers leadership and the Coast Guard to the business community and it led to very productive conversations and information sharing both ways, which was the outcome we had all hoped for.

But in closing, at the risk of underscoring the obvious, I want to just state a couple of things, like Andrew said, that we have noted in Louisiana over the years. Globally, over 3 billion people live within 200 kilometers of a coastline. And that figure is expected to double over the next couple of decades.

And these water systems and other natural resources have historically been the very engines of local and global economic activity and these are the locations where enormous investments have been made by our governments and industry and where our societies have built these towns.

However, because these populations and infrastructure are growing at such an incredible rate along these natural opportunity zones, we continue to see higher cost for response and recovery from natural and manmade disasters and with these needs increasing, we are also seeing the very real possibility of a future with scarcer capacities and resources due to the global economic realities.

And even harder to discus, we see real public fatigue growing about the size, cost and recurrence of disasters around the globe. And so the question is will this somehow move this conversion from the right-hand side of the problem to the left-hand side of the problem and how will these trends not only affect the economic challenges but the humanitarian ones as well.

And during my lifetime, I was taught that the greatest threat and foreign policy challenge was nuclear war and a coined doctrine called mutually-assured destruction.

And I would ask this terrific panel here tonight if they would agree that we might consider the possibility that the greatest national threat and foreign policy challenge for this new century may be whether we can build a truly economically resilient world built upon a new universal doctrine of mutually-assured survival.

I thank the panel for being with us tonight and for the leadership of CSIS and for your kindness in allowing me to speak to you tonight. Thank you very much. (Applause.)

DANIEL RUNDE: Thank you, Tom, for those remarks. We appreciate it. We're here to talk about the economics of disaster prevention and measuring the costs and benefits of disaster risk reduction. And the panel has formed around a report that was published by both the World Bank and the United Nations called "Natural Hazards and Unnatural Disasters."

And I think you'll hear from Olivier Mahul who was one of the contributors to the report and then you're going to hear some responses from Charles Setchell, Shabbar Saifee and Rod Snider. Charles is with USAID. Shabbar Saifee is with FEMA and then Rod Snider is with the American Red Cross. I think that everyone would agree that the discussion around natural hazards has been a topic of increasing salience over the last five or six years.

There has been any number of disasters that have cost hundreds of billions of dollars and so the discussion around prevention and the payoff of prevention and the cost-benefit analysis of prevention is a particularly salient and important one and each of the panelists have thought about these issues.

And there will be a number of challenges that I think will be brought up. One will be around the issue of is it called build-back better, build back or build back stronger. And so I think we'll have a discussion about that as well. So without further ado I'm going to turn over the discussion to Olivier. Olivier?

OLIVIER MAHUL: I need to find the right one first. Okay. Okay, thank you, Daniel, and again, thank you for inviting us and inviting me this evening to talk about this topic. As you said, as Daniel said, I'm one of the contributors to the report – joint report, as you mentioned – by World Bank, U.N. with many other contributors about the economics of effective prevention.

And my contribution particularly to this report was on the financial side on how to help countries before disasters strike, in fact to have the right kind of financial instruments to respond quickly and some extent to compliment what the international community can provide.

And we started the discussion slightly earlier, having in mind that one of the key issues for governments is first not only the kind of emergency phase but also the reconstruction and recovery phase.

And one of the key issues I'd like to discuss with you today is to go back to the rationale of why the World Bank got involved in this topic and also give you a kind of very simple illustrative examples, practical example on how we tried to use the cost-benefit analysis to guide decision-makers when it comes to investment in risk reduction.

So we are all familiar with kind of graphs showing the incidence and impact of disaster which are increasing. And this is something again we keep repeating to our audience because sometimes we tend to forget not only the social impacts which is also disasters but also the economic impacts of natural disasters.

And again, with the concentration of assets and populations in high-risk areas in addition to an economic effect of climate change, we can expect in the future having more and more disasters. And one thing I'd like to emphasize here is again the impact of increased risk exposure in countries like Asia – particularly South Asia where we can see big growth- more than 10 percent a year in some of the countries.

The economic impact and social impact of disaster will be much bigger in the future than it was in the past at least in terms of economic sense and they need to be prepared for this kind of major event. The relevance of disaster risk management at the bank, in fact, I would say started not too long ago.

The initial mandate of the bank – I would say even IBRD which is one of the entities within the World Bank group and means International Bank on Reconstruction and Development. And just the title itself says exactly what we're supposed to do. Our mandate is to help countries to rebuild to some extent or to recover, reconstruct after disasters.

The World Bank itself is not involved in emergency assistance which is clearly the mandate of the U.N. and we have to be very careful on how we define our comparative advantage here. What I like to show here on this graph is that as said here, about 10 percent of the World Bank group's portfolio is related to disasters.

I must say most of them is post-disaster reconstruction but more and more we can see projects where we help countries to prevent disasters, to help them invest in some physical investments before the disaster strikes.

It could be major investments let's say in Vietnam where we're helping the government to build dikes to protect against floods and could be much smaller investments at the community level to help the communities to be better prepared in case of a disaster.

But the key point I'd like to make here is that within the big institution of the World Bank our senior management is getting more and more aware of the needs to think before the disaster and we try also to pass that to our clients. And again, we keep receiving more and more requests from our clients to help them to think about disaster before these kind of major events occur.

One of the major drivers within the World Bank group has been the global facility for disaster recovery and reconstruction – GFDRR – which is a multi-donor trust fund, as we call, with about 30 countries and institutions involved in that. And the Word Bank is just hosting that.

It's not a World Bank tool. It's just a tool set out by many donors, about 30 countries as I said, again to help countries to be better prepared when it comes to disasters. And one of the

main components of the program is about disaster reduction and this is exactly where I think the economics of disaster prevention comes into the picture.

Let me give you now a kind of short illustrative example which is not exactly in the report you mentioned, Daniel, but I think it's a nice concrete example on how we implement the cost-benefit analysis, how we use it and what are the challenges we are facing when it comes to use this kind of tool to guide public decision making on disaster risk reduction.

And the example I'd like to illustrate here is about a project we started a couple of years ago in Colombia – Bogotá –which as you may know is a highly exposed to natural disasters, particularly earthquake. We've had a kind of ongoing dialogue with the bank and with other institutions like the Inter-American Development Bank helping this country to be better prepared in case of major disasters. I said earthquakes. I could also say now flood.

As you may know Colombia was exposed – I mean, faced some major floods even – (inaudible) – more recently. So they face major, major disasters. The project I'd like to highlight and then show you how we use cost-benefit analysis is in the city, in the capital city Bogotá. It's a five-year risk mitigation project. It's not a big project by itself. It's about $160 million, half of that being financed by the World Bank and half of that being financed by the government.

And the key, I would say, actions of this project in fact is outlined in the city's 10-year plan which is about risk identification, risk reduction, risk prevention and awareness and financial coverage.

So within this project we're trying to tackle all these issues. And first of all, the risk identification – you can't manage what you can't really assess well. So the very first step was to really help government to better understand the risks using some risk modeling techniques which are well-known, I would say, in the insurance industry but not so well-known in the, I would say, government environment.

So the first step was to use these tools first of all to sensitize governments about the impact of disasters, not just by showing hazard maps like the one you have here, but also to show them the risk maps, the economic impacts, what could be the major impacts of the 100-year event, earthquake event in Bogotá and what would the impact – economic impact, fiscal impact, social impact, human impact and then how we can try to reduce this kind of impact by having some accident prevention activities.

To do so, we did some very, very basic cost-benefit ratios, and again, really to try to sensitize government but also to some extent to help them to prioritize. So the issue we are trying to do here was to identify key schools, key hospitals, key fire stations, we – the government – should first retrofit. We all agree that in the longer term, all schools, all hospitals, all fire stations should be strengthened.

But in a five-year plan, we had $200 million – (inaudible) – what are our priorities. So the idea was to try to come up with a kind of official active plan in fact to invest this money.

And the challenge we faced here which I think we're going to discuss later when we talk about cost-benefit ratio is what are the benefits and what are the costs. In that case, the costs are well-known.

These are more or less the cost of retrofitting or strengthening the buildings. But what are the benefits? Are we talking about purely economic benefits? How can we take into account the social benefits, the number of lives we can save with these kind of activities and also these benefits are highly, I would say, uncertain.

You're going to really have benefits if you have a disaster. Now, how can you convince a mayor in a city to invest in an event that could happen one every 100 years? These policies of course have a very short-term view – elections. So you need to have a dialogue within this kind of short timeframe which always doesn't fit well with this kind of longer term social benefits that these such investments will create. So it's challenging and this is where we have to be somewhat, I would say, clever to present in a way that they may benefit from these kind of investments with five years.

In other words, the kind of questions – yeah, questions we got from these politicians are what is my electoral benefits of investing in this kind of – in retrofitting buildings. Is it not better for me to build – I don't know –a subway or maybe just to paint the buildings? Why should I invest in some activities which are not always visible for my potential voters? So these are the kind of questions we need also to address when we deal with them.

This is why usually when we talk about investments, going back to the slides, we talk not only about structural investments but also functional investments. In other words, it's easy to convince a policymaker to retrofit a school if at the same time you help them to just repaint the school and make the school look better because this is something that can be well visible.

It looks obvious but again it's something which is quite important when we discuss with them. So these kinds of structural and functional investments really go – work in fact together. One key issue I was saying is that usually when we talk about cost-benefit analysis, we talk about expected terms.

What are the average value, average benefits compared to the costs? Now, the problem again, as I said, the cost-benefit ratio can be almost zero if you don't face a disaster. If I invest in – if I retrofit a building, if in a five-year period I don't face a disaster, it could be seen as kind of money lost. So again, you need to put that into perspective.

One tool we've been more and more using in our projects is what we call probabilistic cost-benefit ratio where we try to show in fact the risk profile of these investments, depending on the – (inaudible) – you have in mind.

In other words, in this kind of project we can say that every one to three years you can expect a cost-benefit ratio higher than one. So it's a good investment for the mayor if he has a five-year horizon.

And this benefit-cost ratio of course will go higher if you consider higher return pay, emailing a kind of bigger or larger disaster. So we've been using this tool, again, to incentivize the government, to tell them that it's not – we're talking about extreme events.

When we're talking about extreme events, working with the average value doesn't always make sense and you need to weight that with the kind of probability of occurrence of these kinds of disasters.

This I quite important because in the World Bank project, one of the key I would say analysis the World Bank board will ask in order to approve a project is what we call economic and financial analysis. We have to show them that these investments from the country perspective make sense.

Each country every three years got a kind of limited number of funds – I would say kind of subsidized access to credit to some extent. And we have to be very careful how we allocate these funds. So particularly when it comes to prevention, we need to have a kind of strong agreement to show to the board of the World Bank as well as the countries that this kind of investments make sense and can be compared with much more traditional investments like building roads.

And in fact you have to compete with these kind of projects and to show that there is definitely high benefits in the short-term. So one thing I'd like to highlight just to conclude is, again, this concept of dealing with uncertainty, dealing with a short-term horizon for policymakers versus long-term investment you have to make – the kind of social investments – (inaudible) – natural disasters is something which is quite challenging.

And again, any kind of economic and financial tool helping us to better incentivize and help decision-makers will be quite helpful. Again, we did that and it should be something that should be further developed and, again, any kind of ideas, research projects related to that could be quite welcomed from the World Bank perspective.

MR. RUNDE: Thank you, Olivier. The discussion about determining the calculus – the cost and benefit – there's a story in Japan about a small town mayor who built a massive tsunami wall and for many years he was laughed at and he is not, you know, so there was this issue of this was built in the '70s and so I think about that graph in terms of the payoff of that tsunami wall was 35 years later.

But now that mayor is looking like a genius for having done that. So it's sort of that sort of a calculus and that political calculus and how do you balance that is a particularly challenging one and I think a universal one. Charles, the floor is yours.

CHARLES SETCHELL: Thanks. Good evening. Thank you, Stacey White, wherever you may be for inviting me and extending the invitation. I appreciate that. Thank you as well to CSIS and LSU for supporting this series, a very, very important series of lecture. And last but not least, yourselves, the audience, thank you for showing up on this fine evening. I bear gifts. I don't know if you've seen the handout that I've brought.

MR. RUNDE: It was in the back.

MR. SETCHELL: If that was circulated, we'll get to it in a few minutes. So maybe there's time to circulate it if it hasn't come yet. Briefly, I have 13 years of experience with USAID office of U.S. foreign disaster assistance as the shelter settlements and hazard mitigation advisor. I've helped design numerous projects, shelter and otherwise, pretty much in all of the major disaster responses of the last 13 years and many of the smaller ones.

Literally, we have sheltered millions. That's the good news. And the not so good news is that literally we've sheltered millions. We've had a lot of integration of DRR – disaster risk reduction – into those programs. We can go into some of that in a few minutes. Prior to that, I was an environmental and urban planner and housing economist, both by degrees and at 20-plus years of experience both here in the U.S. as well as abroad.

I spent six years in Indonesia prior to coming on board with OFDA in 1998 and have been back to Indonesia several times since – tsunami, earthquakes, et cetera. And I think to give you an idea of how dramatically times have changed and come full circle.

In fact, when I arrived at OFDA in 1998, I was saddled with the somewhat onerous title of urban planning and urban disaster mitigation specialist, which apparently violated the U – urban, P, planning, and M, mitigation sections of humanitarian law and was only muttered quietly in polite audiences.

I changed my title after a few years of puzzled looks but am now considering switching back from my current humanitarian-friendly title back to that earlier UPNM focus in light of the discovery – and I will say that again – discovery of urban areas, an increasingly dominant form of human settlement in these past few years, the emergent focus on mitigation and other forms of DRR and the increasingly recognized need to guide future actions in human settlements through an informed process called planning.

I wish my mom was still around to read the World Bank's report, believe it or not, for it places emphasis on an important game changer, namely cities and the need to develop governance, processes and institutions to promote safer cities. If nothing else, it would have put to rest those long ago debates that mom and I had about whether or not I should pursue an urban planning degree.

Wherever you are, mom, rest assured the World Bank has got my back. And I think I want to digress a little bit – the Rockefeller Center a few years ago – Bellagio Report – I think it was about four or five years ago – brought together U.N. Habitat, UNDP, World Bank, all kinds of different groups, organizations and came to the conclusion that we're not producing enough professionals – development professionals, architects, engineers, planners, all of those types of folks that are needed to build human settlements.

We have a major deficit facing a very large curve, growth curve. So we have a significant challenge. I'd like to focus attention on the use of economic analysis in our work at the U.S.

office of foreign disaster assistance, or OFDA, as really it relates to both response and DRR activities. For those of you unfamiliar with OFDA, the mandate is very explicitly humanitarian and saving lives and reducing suffering and reducing the economic and social impacts of disasters.

The last phrase of the mandate, which some of us call the "third phrase," has been interpreted over time to mean efforts to reduce various forms of risk in disaster- and crisis-prone settlements. This is a range from short – three-, six-, nine-month interventions – to longer term – three-, five-, seven-year commitments – to reduce risk in numerous sectors including those associated directly with natural hazards, be they floods or fires or hurricanes or cyclone or earthquakes.

And that list is fairly long, as you well know. Recent examples that I have been involved in directly include flood risk reduction, hurricane risk reduction, promotion of seismic-resistant construction and something I call settlements planning 101 – basic urban planning as part of the disaster response effort.

One of the, I hope, lasting legacies of our recent response and our ongoing response in Haiti is support of Haitian diaspora professionals – engineers, planners, architects – who have worked with various ministries, the Haiti interim reconstruction commission and others to really help infuse a process of planning into the response and recovery effort.

It's something that is sorely lacking. I talked to the minister of planning when I was there most recently and he said he had two trained urban planners on his stuff for the country of Haiti – two. We quadrupled that with our diaspora program.

The handout that was circulated is but one example of many OFDA projects focused on DRR – in this case, a small flood risk reduction project in Kinshasa, DRC, in the late '90s. It consisted of a very small – a series of check dams and a watershed – a very affected watershed. There's a part of Kinshasa that is so vulnerable to flooding and watershed erosion that it's called "the islands." The area is just so removed from the mainstream of the urban fabric because it's just situated on very highly erosive soils.

So we went in with very small-scale check dams made of bamboo and grass and rock and all of those things. I bring this to your attention because I think the intervention between two very similar storm events really facilitated an economic analysis that, as you were saying before, we sometimes don't know when the payoff is.

This was very good in that we eliminated a lot of uncertainties associated with valuing DRR costs and benefits because we had a timeframe and cause and effect – uncommon. So by adopting conservative assumptions and only accounting for direct economic losses, $1 of our OFDA investment of taxpayer money in risk reduction resulted in a savings to the community – affected communities – of $46. That's not bad. That's not a bad turnaround.

This savings has occurred up to the present time. We haven't gone back. We've invested significantly elsewhere in DRC but we haven't had to go back to that particular area. And one of

the important aspects I think of cost-benefit analysis is not just the numbers themselves and our return on investment and savings and what have you but really how does it affect the affected community.

The particular communities that we were working with in Kinshasa were very extremely poor communities and very vulnerable. And so our risk reduction measures resulted in a savings, a cumulative savings of about $425 per family, or the equivalent of about half of average annual household income thereby enabling those families to purchase food and clothing and medicine and other essential items that they may have had to forego had there been another flood event.

So not only do we have costs and benefits but we have impacts and the implications of that investment. Again, I think another – if there's such a thing – there's another beneficiary in this story and that was OFDA. We were able to husband our resources and apply them elsewhere. We repeated that success in Kinshasa elsewhere after flood in subsequent years to great effect as well.

We've had this significant return on investment, small-scale investments in this case. And I think I would like to say that an unintended benefit and something that we often don't pick up until later after we've done the formal review is really how our management of water in that watershed – that improved watershed management really resulted in significant public health benefits as well.

We found a significant reduction on the order of over 90 percent in the incidence of cholera in the affected project area subsequent through better water management. We've seen it in places like Bamako, Mali, and Nouakchott, and Injomina (sp) and other places where by just basic water management through a risk reduction type of intervention we also have these secondary impacts that are very, very positive.

So more generally, OFDA is linked to economics and DRR programmatically in recent years with the creation of a new sector called economic recovery and market systems which focuses primarily on livelihoods and livelihood restoration. Some EMRS projects feature an input to DRR activities themselves such as re-vegetating watersheds to promote both enhanced water retention and livestock recovery and entail market assessments and informal cost-benefit analysis field based.

More generally still I'd like to note that the World Bank support on the economics of effective prevention reminds us that CBA is a useful "guide," quote, unquote, but not the sole judge. Other factors should also be considered in making decisions. Thus, although the bank report promotes the science and business of CBA – cost-benefit analysis, so to speak – it also reminds us that there remains an element of art in CBA as well.

How to judge the value of life, for example, is far more than mere economics, as the report recognizes and I think correctly so. In closing, I note at page 20 of the report that greater exposure need not increase vulnerability of cities if cities are well-managed. What does

managed well mean in this regard? How will CBA be used to define what well-managed is? And this is not a trivial matter.

A bit more than 50 percent of humanity lives in cities these days. Cities are the dominant form of human settlement and will be for years and years to come. The current rate of urban growth -- the equivalent of a city of 1.4 million people will emerge every week of every year for the next 20 years. That's a lot of people in cites.

Further, 1 in 6 human beings currently lives in conditions depicted by the recent film "Slumdog Millionaire." Everyone has probably seen that movie. And current trends suggest that 1 in 4 humans will live in such conditions by 2030. We'll see in the cities of developing countries where about 100 percent of future – the next 20 years – global population growth will be concentrated. We'll see that doubling of population.

We'll see a tripling of the footprint, the land footprint. That has implications for risk reduction at a very, very high level. And the great rise of cities and city slums will entail a lot of development decisions of all kinds at a level and pace we've never seen, often entailing considerations of hazard risk. We need plans for urban places that are not only aspirational and inspirational but also very, very operational.

Those of us in the humanitarian community would do well to not only highlight the need for DRR in the coming years but be an active partner in identifying and managing harm's way, those hazard-prone areas that seem to draw more and more people over time so that human settlements of all sizes can be configured and reconfigured to increase safety and reduce the cost of poorly managed settlements.

This will take a lot of work, of course. Missing it seems in a lot of current discussions is the need to promote the third R of risk reduction – resonance or amplification. Through concerted efforts at managing development processes and promoting recovery after disasters, that is neither simply build back or build back perfect which seems to be a goal of many but build back safely, build back stronger, build back better, build back however you want. But do it with DRR in mind.

This effort will entail significant focus and resource application in support of governance programs that foster institution, community level and professional capacity building. This is overlooked in the extreme at the current time. Perhaps equally important, the effort will require strategic communications programs to increase understanding of and demand for DRR.

Let me repeat that – demand for DRR as a centerpiece of development and humanitarian activities and not merely as a mainstreaming initiative. I think the World Bank report provides us with an insight in this regard and for that, we should all be very grateful. Thank you for your time and patience. (Applause.)

MR. RUNDE: Shabbar, without further ado?

SHABBAR SAIFEE: Good afternoon. My name is Shabbar Saifee. I work within the mitigation programs at FEMA, the Federal Emergency Management Agency. Most of my time I'll spend on talking about how FEMA looks at benefit-cost and what is the rigor applied to benefit-cost analysis for mitigation projects and programs.

But before I step into that realm, just to give you a general sense with the number of natural disasters you hear about nowadays through CNN, we call them "CNN disasters" because they make the declaration before the resident gets a chance to declare the disaster. But there are a lot of little disasters that happen in communities all the time and FEMA responds to those disasters on a daily basis.

At any given time, I would venture to guess there are more than a hundred natural disasters FEMA is responding to throughout the year. Having said that, just to now focus, FEMA does three big things. It does immediate response, it does recovery and it funds mitigation.

For a general ballpark figure, the way our grant programs are set up for response, recovery and mitigation beyond all the interactions you see in the media, we give a lot of grants to communities and states to accomplish these objectives. And the fundamental approach we take is the community and the state has to evolve and develop these projects rather than the federal government coming and telling you that you need a bigger bridge or a smaller house.

We want the mitigation to be coming up from grassroots, from the community level because community is in the best position to determine and the state government is in the best condition to determine what is appropriate mitigation actions, keeping in mind their hazards, their vulnerabilities and overall risk. In terms of dollars and cents, we are averaging in the last few years about a billion dollars in mitigation grants to communities and states every year.

So that's a formula that we apply based on how much assistance we provide for response and immediate recovery. We apply a multiplier to that and say, okay, this state gets X number of dollars and the multiplier is generally 15 percent of the total expenses FEMA incurs for a given disaster. Having said that, mitigation includes a lot of things from our perspective. It includes good planning at the community level.

We require communities to have mitigation plans that FEMA will review and approve because when disasters strike in that community or that state, we will encourage communities to use that plan as a basis for their mitigation strategy.

So upfront thinking and planning, urban planning, development issues, building code issues, all those aspects are discussed by the community in those mitigation plans and plans are obviously as good as how many people engage in the community in developing those plans. What is the definition of mitigation? FEMA's definition of mitigation is actions taken to reduce or eliminate loss of life and damage to property.

I will delve into over the years now, again, FEMA – I don't know how many of you know – but the amount of people that are staffing at FEMA is less than the staffing of a police

department in any medium-sized town. Today FEMA employs nationwide 5,000 people. That's how big FEMA is in terms of its staffing level, permanent staff.

So that's why one of the reasons we want communities to engage is we are not going to be able to develop their plans for them. We are not going to be able to determine which projects are appropriate to fund. We are not going to be able to do benefit-cost for every project they want us to fund. We want communities to do that.

Now, to empower a community to do that we have to build useful tools, tools that are usable and we don't need economists like at this table to run those benefit costs. We don't need – because if we need economists to run benefit costs on every project we fund in a community, then the cost of analysis might be more than the cost of a project.

Keeping that principle in mind, we have built software tools – right, Olivier? We have built software which can be used by a nonprofessional. You don't need an engineering background or economics background. You don't even need to be an expert at mitigation per se because these community officials on a day-to-day basis have different roles. They could be the mayor in a small town.

They could be the building code official. It could be the city planner. These are the people coming together to play the role of figuring out what's the right mitigation for themselves. The tools that we have built apply to various types of hazards and they're specific to the hazards and the project types. Over the last 25 years, FEMA has been funding mitigation grants. We have a general idea of what kind of projects communities like to fund from a mitigation perspective.

Eighty percent of our disasters are related to floods. When a big hurricane comes, most of the damage is because of flooding. So we think flooding. We think wind. We break up a hurricane into two pieces in terms of how we look at it. We look at wind damages. We look at flooding damages.

Earthquakes, tornado safe rooms, tornado winds – recently we've had amazing incidences across the country on this issue and we have found with our experience over the years safe rooms is truly the real mitigation solution to deal with tornadoes because when a tornado comes, the thing we want to worry about is not the home.

We want to worry about the occupants because at 250 miles per hour wind conditions, most of the structures that are residences are built – the way they are built in America – would not survive. We typically have stick frame structures. We built houses with wood. They are great houses to survive some amount of earthquake and some amount of wind because they are flexible. But if a tornado wind comes, it picks up everything.

So over the years FEMA has funded about 20,000 safe rooms across the part of the country where there is high probability. And actually these recent unfortunate incidences have shown us that lives have been saved because of these tornadoes. We are focused on lives primarily when we talk about tornadoes. We are focused on lives when we primarily talk about

earthquakes in terms of what we look at is an appropriate level of reinforcement to a building to build to survive these type of disasters.

When we talk about floods, wildfire, we think as much about structures because for wildfires and for floods generally, there is a good amount of warning for us to evacuate ourselves. So our concern is what can we do to mobilize the impact on the structure and the built environment. At FEMA, you've seen literature. A lot of times people only talk about this principle and they use the phrase "cost-benefit analysis."

At FEMA we always call it benefit-cost analysis because our philosophy is we are really focused on the benefits of these actions and not as much the cost. And generally our rule of thumb is once we go through that probabilistic calculation that Olivier talked about, similar principles, we look at a benefit-cost ratio.

If it's greater than one – so if the benefits over the life of the project are going to be greater or equal to the project cost in economic terms, applying, you know, various economic principles – then we determine the project to be cost effective. Once we determine the project to be cost effective and it's an appropriate mitigation project that meets certain other requirements per the law, we say that project is eligible for funding and as long as money is available in that grant program, those projects get funded.

There are various kind of damages we would – parental damages we consider when we do the calculation of what the benefit is – damage to the structure, damage to contents, loss of function. If there's a library, a school building, a courthouse, when those buildings are nonfunctional, there is a loss of function. There is a cost to community every day of that service not being available. So we incorporate that into our calculations – displacement cost.

My home is flooded. I can't live in the home so I have to go get a rental space or go live with my relatives. There's a cost. There's a cost the society or individual is paying for displacement. We include those costs .rental – if we are looking at mitigation a business, then we are looking at the income loss for the business.

Loss of services – if the distribution system for power or water is damaged or we are mitigating one of those issues, for us not to get power or water to your given home for – there's a significant cost to society. The cost is not what your water bill is or electricity bill is. It's much more than that. It's more than a hundred dollars per day for a person without electricity, for example.

Economists have helped us come up with these numbers which are averaged nationwide. Again, because we are operating in a U.S. domestic environment, these are hard numbers we can work with.

In the international environment, the challenges are of course very different because the cost of these services and value of these services are different in different societies and different economics. Casualties – we do unfortunately or fortunately assign a number to injuries – minor

injuries, major injuries and loss of life. It's significant. It's based on federal studies. That's the value of a statistical life or a statistical injury, not my life or your life.

MR. RUNDE: Three minutes.

MR. SAIFEE: Three minutes, okay, I do speak a lot. I'm going to skip some of these slides and partly Olivier has talked about probability, you know, some of those things and the same principles apply. We are currently started a project to quantify benefits from environmental impacts.

At this time, we do not know what is the value of saving salmon in a certain river because I moved a house away from the banks of the river. So this is just a very simple – an example of how we look at environmental benefits and there are huge environmental elements. So we have started some work in trying to see how we can quantify those benefits and we are working with expert economists that, you know, come from academia, industry and government.

Talking about benefits, when you talk about benefits, you have to look at what is the life of a project. Olivier talked about the political life of a project is how long this guy is going to have an opportunity to get reelected. We are looking at physical life of a project in doing benefit-cost. So retrofitting a home, generally we say the life is 30 years because typical homes need significant renovation every 30 years.

So we have come up with these average numbers based on what engineers know about the life of these mitigation projects. I have a few comments in the international arena which are different from the domestic arena. Mitigating the risk for people and not buildings to me seems to be more important in the international arena. Saving lives comes first because the infrastructure is a totally different ballgame in the international arena.

Lack of insurance creates other additional challenges in the international arena. I don't know how many of you know there's only – the largest flood insurance company in this country is owned by the government and there is only one and FEMA runs that flood insurance program. Private insurance companies, most of them do not sell flood insurance. They of course sell on behalf of FEMA as a rider on your regular home insurance policies.

The software we have, there are multiple versions of that and the uniqueness of the software is it can be used in the international arena because it's the relationship between damage and frequency.

So if you can quantify damage in terms of dollars, cents, rupees, euros and you can assign a frequency to that given event and you can run this benefit-cost model. You don't need to know anything about the risk at that point specifically from a technical perspective.

So it's basically a damage frequency relationship where you feed into the software and it will do a benefit-cost for you. It's independent of currencies. It's independent of – you can adjust the interest rate whatever value you want to assign to the value of money calculations.

MR. RUNDE: Shabbar, I think we –

MR. SAIFEE: I'm done.

MR. RUNDE: Yeah.

MR. SAIFEE: Sorry.

MR. RUNDE: Great, thank you. (Applause.) Okay, Rod?

ROD SNIDER: Going last, everyone steals my thunder anyways because I have very similar slides to some of the other ones. I first want to thank CSIS for this event. I also wear a hat where I'm the co-chair for the interaction disaster risk reduction group and we always look for opportunities to highlight disaster risk reduction and to move that agenda forward.

So we think this discussion around cost-benefit analysis is really important. And Tom, we would agree with you that most of the NGOs would agree that safer, more resilient communities is where we want to go with the future. And one of the biggest impediments to development is disasters.

They use a statistic that Hurricane Mitch set Honduras back 10 to 20 years on development gains. So we definitely want to see disaster risk reduction mainstreamed within development goals. So that's a very important aspect. Let me get this up. Dan alluded to acronyms.

So I'll start with my title's acronym – cost-benefit analysis of disaster risk reduction and climate change adaptation – throw some acronyms at you. I'm going to start off again very similar to Olivier with disaster trends. Just a couple quick notes, right now there's about 250 million people affected yearly by disasters. Ninety-eight percent of them are weather-related. Oxfam predicts that in five years that's going to double by 50 percent where the average population that will be affected by disasters is 375 million which will completely overwhelm the current humanitarian capacity.

So we definitely see the trend going forward. Some people would say that that could be just because we're getting better at reporting. But it's not. If you take some of these issues, just with peer population growth and urbanization, which Chuck alluded to, we're going to see an increase in disasters. I often talk about that. Unfortunately I'm in a growth business.

Disaster management is going to continue to grow quite rapidly just because population growth and urbanization. I just heard a recent statistic. By 2050 – right now we're about a 50/50 global society – 50 (percent) living in rural areas, 50 (percent) living in an urban society. By 2050, that's going to be two-thirds of the people are going to live in urban settings and with the population growth, that's out of 9 million, 7 million are going to live in urban areas.

And a lot of them are going to live in marginalized areas. They're going to live on flood plains. They're going to live on steep slopes. They're going to live in shabby housing, very

similar to what we saw in "Slumdog Millionaire." So just that alone we're going to have to deal with more and more disasters.

And I contend that the international community is not very good yet at working in urban centers. I think Haiti is a good wakeup call for what we need – where we need to go and get a lot better at it. These trends are only going to be exacerbated by climate change. We're going to see an increase in the frequency and the intensity of disasters. And this is really going to erode the ability of households to cope.

What's interesting about climate change, what's going to happen is right now a lot of areas where we have disasters, you have historical knowledge. Climate change is going to change that. So right now we have a hurricane belt and a lot of communities within that have hurricane experience. That hurricane belt is going to shift. We had a hurricane in Argentina a few year ago – had no idea what to do. The tornado belt could shift up.

So not only is it dealing with more disasters. It's dealing with unpredictable disasters and not having a historical knowledge of that. And of course most of the impacts of climate change and/or disasters are impacting the most are in developing countries with vulnerable populations. And again, we're going to see this expanded with huge urbanization growth into marginalized lands.

And what we're seeing is that the regular disasters are increasing and therefore that's eroding the capacity of the households to be able to become resilient. It's putting them in a spiral of poverty and so we have to break out of that poverty. Getting to cost-benefit analysis, disaster preparedness works. We know this.

This is a good slide that proves we're getting much better at saving lives but we're still having huge economic losses. We're seeing this trend go down. I think some very stark examples give you of where preparedness work and where preparedness doesn't. Haiti versus Chile – right after the Haiti earthquake, a month later, two months later was the Chile earthquake – very similar magnitude, very similar density population, a very, very – a stark difference between loss of life.

Chile has a culture of preparedness. So preparedness does work. I think the other good example is Japan and Aceh. The recent Japan tsunami hit a similar band of land mass as Aceh but we had 20,000 loss of life which is still huge but with the size of that tsunami whereas in Aceh it was 200,000.

So we know just intuitively disaster preparedness works. What we've got to get better at is doing cost-benefit analysis on what that works and particularly in developing countries. I think we can use a lot of this financial modeling as examples and I know FEMA sometimes uses a ratio of 1:4, every dollar spent saves $4 in preparedness.

You see these different ratios rolling around which are important because I think we need to use those particularly to show donors and governments and businesses that investing in disaster preparedness works.

But where I think we need to do that is translate that more at the national and subdistrict and local level, really what is working and with limited resources where is that return in investment going to be because we have scarce resources and we have limited choice.

So from the American Red Cross perspective, we work at the community level and so I think a lot of what we heard was – we heard some community stuff. But the report that came out from the World Bank is a really good indicator that, again, preparedness and disaster risk reduction works. But it's at a very macro level. Where we're working is down at the community level. We see community as the first responders.

We often think we're the first responders or even the Red Cross in countries are first responders. It's the community and the neighbor that's the first responders. So we have to give them the skills to be able to do that. And in a lot of developing countries, you just do not have a fire department. You do not have a police department. You do not have the infrastructure to allow that.

So it's the communities that really need to be prepared to do that. And so we have a model that's called community-based disaster risk reduction which is a participatory approach that walks the community through what we call a VCA – vulnerability capacity assessment. And most communities have capacity to be able to have action that reduces their risks.

And we take them through a process that helps them identify what their risks are, what their capacities are and what their vulnerabilities that then lead to action planning. And then you can have – then we do first response training. We do first aid training. We do early warning, early evacuation. And these are all things that the communities can do themselves.

But what we're trying to do more of is put a cost-benefit analysis model on that to help the communities to really look at what interventions are going to get the best return for their dollar. So what we're seeing is this model is being used to inform and evaluate a range of interventions. It's a decision support tool to decide on the range possible interventions to reduce risk and maximize benefit for every dollar. I'll give you an example.

In Nepal we were working with the community and they came up with a list of interventions they'd like to do. They wanted to build a bridge that gave them market access plus would be an evacuation route. They had drains that were clogged up and so they wanted to clean those out and build better drains for flooding and they wanted to look at riverbank enforcement or improvement. And the community really wanted to do the bridge.

They felt the most important thing was market access and they wanted a place to evacuate. But when we ran them through a cost-benefit model that actually looked at some of the social factors, it ended up being riverbank enforcement was what was going to be the most important because that protected their crops from being destroyed and annual flooding – or flooding was increasing to an annual event.

And so when we put them through that modeling, they were able to actually put a – it helped them make that decision where they would have made another decision just based on intuitive discussion. Taking them through a CBA also then helps them go back to the government or go back to other NGOs and say, look, we've done this analysis. We've done this modeling.

For this amount of investment we know we're going to get this return. So it's a great model to use for the government. And it takes the communities away from just getting outputs to really looking at outcomes and this is a good – another advantage of the cost-benefit analysis. Cost-benefit analysis encourages an open discussion as well. A lot of it, it's just taking people through the process. It's not necessarily the end result but it's looking at options and putting some numbers on that.

And so we're seeing through this participatory approach it's helping communities have a conversation. However, there are challenges with this community-based approach. One, it is a risk assessment and so it's a lot of opinion. It's not based on empirical data. It's based on local knowledge. And so that in itself is inherited throughout the process.

Data collection is challenging. Again, I would say in the United States it's much easier to do cost-benefit analysis because there is a lot of secondary data that's already available and that's already been done to build on. In a developing country, you don't have any data and therefore you're going to have bias. You're going to have conflicting and inconsistent information across the board.

And so this can definitely skew your outcomes. And it's not – it's not implemented systematically. So it's very hard to make comparisons across the board. So this may work in this community but if you go to try it in this community it might not necessarily work. So comparisons are very difficult. And then social factors are hard to measure.

I was in a recent presentation where an NGO was walking through their cost-benefit analysis and they got hung up on valuating life and it really just stopped – because the discussion just stopped because they just couldn't get past that and it was really hard. And then social factors are just very difficult to measure and quantify.

Some interesting things that have come out of this, though, is that what we have seen when you put a cost-benefit analysis on some of these interventions, if they're tied to development, they tend to have – they seem to have a better return for their money. So for an example, boats that are used for an evacuation, if those boats are rented out in nondisaster times, they generate income.

Evacuation centers are now often used as community centers. So they're maintained better. They're ready to go so that when disasters hit, they're used more and then I think another good example is we've done a lot of market access. So not only does it improve access to markets but it's an evacuation route.

I did a project in Pakistan where up in the mountains everything is done by trails and they can be really small. Just by widening that trail, it decreased the time to get to the market by almost two hours and then it was also easier access to get injured people down to hospital. So yeah, I'm done. And my last point is that we're seeing soft resilience as opposed to – soft-scale resilience measures as opposed to hard.

Cost-benefit analysis is often attached to infrastructure projects or tangible things. But when we start putting it on soft things like early warning, training, we're seeing that there is a much better return on investment in a lot of these soft mitigation activities. Thank you. (Applause.)

MR. RUNDE: Thanks very much, Rod. I think we've heard several messages today. It pays for – preparation does pay. We've also had a discussion about a spectrum of cost-benefit analyses. We've had sort of the community TurboTax version of cost-benefit analysis to the much more sophisticated version that the World Bank provides to national and subnational governments.

But it sounds as if one of the challenges here is how do you build the capacity for communities, subnational governments and national governments to have the capacity for resilience, for people to make rational choices and how do they balance that against a number of different challenges. One was political.

There's some discussion in the report about the politics of this and there was some discussion in Olivier's comments about that in terms of how do you – if you've got such a long timeline, if we're talking 20 or 30 years before you see the benefits of an investment, what's the rational – why would policymakers make the decision if they get rewarded on a shorter term basis than that.

And so that's a particular challenge event though it's not a pleasant one to think about. And so I think there are any number of different tools that have been discussed but also we've also discussed ways in which communities and societies can achieve resiliency, that there is actually – that the reason the work was done is that there's a belief that we can actually see change happen and there are societies that were discussed – whether it's Japan or Chile where you're talking about a culture of preparedness and how do you achieve a culture of preparedness. Maybe – I'm just cognizant of the time.

I know we're going to have – I want to make sure that we have some time for Q&A. But I'm just wondering if each of the panelists could give a very brief – maybe a minute or less – comment on how do you create a culture of preparedness, if you could just give your views on that. Maybe I could start with Rod to speak to that and each of you could just go down the aisle and then we'll open it up.

MR. SNIDER: It's a long-term process and again, this is what DRR – disaster risk reduction is often housed in humanitarian sections. But it's really a developmental issue and it takes a long time to build that culture. We see it a lot in schools as a good entry point and where

students are open to new ideas and we see students as change agents that often can take messages back to their communities. And the Red Cross has a good entry point into the schools.

MR. RUNDE: Great. Shabbar?

MR. SAIFEE: yeah, I think I completely concur with what Rod said. I think one way at an agency level or an organization level, we do is we give out grants where we ourselves do a lot of outreach and education on the value of preparedness. We have also built a lot of tools that are available for communities to use to go through the cycle of what it means to prepare at an individual level, at a community level, at the school level, what is the infrastructure that need to be in place, so yeah.

MR. RUNDE: Okay. Charles?

MR. SETCHELL: We have less a focus on policy and codes and regulations. We try to develop better building practice, for example, training. With Red Cross, we've often in the past done multilevel types of training from informal education in the street – street theater, puppetry, comic books. You name it, we try to do it. And strategic communications at a more kind of macro level – we've done a lot in the last year with text messaging. In Haiti that is trying to get some key, key messages across on DRR.

MR. RUNDE: Olivier?

MR. MAHUL: I mean, from the World Bank perspective, there are two different dimensions. One is at the institutional level, since our clients are governments and I think it's a long term unfortunately to build within the kind of policymaking decision process this kind of culture of preparedness and there is a lot of work to be done.

In parallel, we are doing some work at the I would say macrocommunity level through some livelihood projects where we can use comic books, where we can use short movies. And again, it's a long-term process.

And I think you need to build on both – kind of the institutional aspects because you want that to be well institutionalized and at the same time you want to make sure that at the ground level people – (inaudible) – to some extent just to implement the rules and to apply or to comply with the rules that could come from the – (inaudible).

MR. RUNDE: Great. You all have been very, very patient. I'm going to collect three questions and I'd ask you to tell me your name, your affiliation and a very brief question. So there are microphones. There's a gentleman here and we'll start with the gentleman here. But we're going to capture three questions.

Q: Very briefly, Robert Schroeder (sp) international investor. I wonder if you couldn't also educate or elicit the help of the insurance companies, business and investment community on this.

And my specific question is for example in the case of the Japanese tsunami protection that lasted for 35 years, that's 35 years or it should have been of reduced risk premiums on insurance, not just for the town but for every business, every residence in that town. I would think cumulatively that could make a strong argument for why there's money savings in doing these projects in the future.

MR. RUNDE: Yeah, other questions from the audience? The gentleman here?

Q: I'm James Turner from the National Oceanic and Atmospheric Administration. I guess one of the things I'm a little bit surprised by is I haven't heard anybody talk about public risk education in that, you know, very few of the public understand what risk is.

They understand the risk between 1 in 100, 1 in 10,000 and what it may mean and also to as you do some of these analyses, you know, to make sure that the people understand that, you know, when you do this probabilistic calculation, it's not a number that you arrive at but there are huge uncertainties around that and maybe that will help you to rank order the relative risk. But again, you know, if you could address risk education and risk communication also?

MR. RUNDE: Okay, third question? The gentleman there?

Q: Hello. My name is Sergio Lacambe (sp). I work for the Inter-American Development Bank. I have a question for Olivier. How useful is the cost-benefit analysis tool for assessing projects aimed at institutional strengthening or policy reform? I'm talking here not about, you know, the typical investment projects but rather, you know, soft projects. Thank you.

MR. RUNDE: Why don't – I'm going to take these a little bit out of order. Maybe I would ask maybe Rod or perhaps Shabbar to take the second question about public risk education. And maybe Rod I suspect you could just speak – could you just speak to that and then Shabbar after you.

MR. SNIDER: It's tough. Public awareness campaigns sometimes work. Sometimes they don't. We are looking at in Almati for example which is very at risk to earthquakes of doing a very intensive citywide public awareness campaign. Again, we feel it's getting it down to the community level and we do do risk analyses there and risk education.

When we do our vulnerability assessment, the first thing that we work with the community on is taking them through their risk analysis. So we do do risk education at the community level. And a lot of places it's difficult to do it nationally. Indonesia, for example – it's 17,000 countries – or I mean, 17,000 islands. That's the size of New York – I mean, the size of the U.S. from end to end. So it's got every hazard except locusts and I think it has that as well. (Laughter.)

MR. RUNDE: Shabbar, on the issue of risk education?

MR. SAIFEE: I'll just share some of the things FEMA does in terms of risk education. We approach risk education at the national level primarily in the context of flood disasters. I

don't know if any of you all have seen those commercials of FloodSmart where the water rises in a house and some of the demonstrations out there on national television. We approach it that way.

At the community level, we do a lot more community outreach and education post disaster in the communities that have been impacted.

Just to give you a specific, after a disaster, if 10 counties are declared disaster areas, we will open at least one disaster recovery office in each community and homeowners and individuals and business owners, they all come and they go through a process of education and what kind of support system and mechanisms are available through all of the – through the whole federal family whether that's Small Business Administration, whether it's FEMA, whether it's Red Cross.

All these entities are sitting there. So and that's where we do a lot of the education in the context of that hazard and the mitigation proposals.

MR. RUNDE: Charles and then Olivier, if you could each speak to the issue about insurance and the investment community?

MR. SETCHELL: Sure. Thank you. One experience that we've had with the private sector and insurance companies in particular has been in several countries in Southeast Asia, of working very closely with them to develop a series of building practice training programs that are tied to – it's almost a precursor activity to the establishment of insurance markets. In Indonesia, for example, when I lived there years ago I think 2 percent of the households in the country had some form of insurance.

So it was very much an emergent market kind of situation. So there had to be some precursor activity of really promoting higher bars of standards and what have you and standardization of materials – building materials, construction materials and the like.

We've had some very, very positive contributions from AmChams – the American Chamber of Commerce – in various countries. And Indonesia is probably the best example that I know of because the president who was a good friend of mine for some time. Also in Turkey and Central Asia, places that you wouldn't normally think would be a large community. There's been a lot of support from the private sector, not just the intentional community but also the local community.

I think these issues of continuity of service, for example, in the local banking industries and offices and the hotel industry, tourism industry. They're looking at particularly with earthquakes for example – they want to know how their services are going to continue.

So this issue of critical kind of internal infrastructure as well as public infrastructure is something that is very, very keen and I think people in the private sector have a leg up in some regard in understanding the real true benefits and costs of what. And we try to incorporate those wherever we can and the DRR program that we do in places like Istanbul.

MR. RUNDE: Olivier, if you could speak to that?

MR. MAHUL: Yeah, I mean, it's interesting because in fact the two questions I would say are closely related when we talk about disaster risk management at the bank, we tend to work on five pillars, one being institutional capacity building, the other one being risk assessment itself, emergency preparedness, risk reduction and financial – I would say disaster risk financing. So I would not try to exclude one against the other.

I think it's really you kind of need to work on the five pillars and I think it's five or nothing. It's not one or the other. On the insurance – just on the insurance component, this is something – I mean, coming from the financial sector myself at the World Bank, this issue of public-private partnerships is quite important, particularly when it comes to risk assessment.

Again, I think that to some extent the insurance market can provide tools, if not products, but at least tools to help us to better price the risk. And I can take examples related to earthquake or related to agriculture when you can price the risk, it's a very good economic signal you're going to send to your counterparts. They have developed, as I said in my presentation, they have the tools to help us to price this kind of risk.

All these kind of catastrophic modeling techniques come from the insurance sector. Now, how can we use insurance to create the right incentives? This is something that is a bit tricky because in many countries and the U.S. also, insurance is not fairly priced, meaning that if you take flood insurance, you know, it's highly subsidized. So you do not always send the right signal for political reasons.

So in many countries it's very difficult for us to convince governments first of all to develop proper insurance markets based on private, I would say, principles and also to let the market price the risk accordingly. The governments may always tend to come up with a kind of universal coverage at universal price with some cross-subsidies between that.

So this is something, again, which is quite difficult to tackle. We do have some successful examples like in Turkey where the World Bank helped setting up the Turkish catastrophic insurance pool and this is one of the few programs in the world where your premium will depend on your type of building and the location you live.

But again, they're quite unique. On the other hand, we've been working with the government of Romania and the government of Romania decided to commit to one single premium rate for all the country. So again, we need to work around these kinds of private incentives versus the kind of political economic dimension.

Quickly on the last point, institutional strengthening, as I was saying, this is of course where you can reach the limits of these kind of economic tools and from our side, as I said in my presentation, we really focus on some physical investments where we think that cost-benefit analysis can provide some guidance, not being the final tool but at least can provide some guidance when it comes to soft investment including institutional capacity building.

From our side, I don't think that we can really price it properly. The way, again, that we sell it to our clients and to our board at the bank is that it comes within a package and if you have to invest in risk mitigation, physical risk mitigation, you also have to invest in institutional capacity building. One or the other is not really the alternative.

MR. RUNDE: I think our time has ended. I hope you'll join me in thanking the panel.

(END)