Emergence of Sustainability in a Complex System: Are Lessons From the Health Sector Applicable to Food Security?

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Presentation Transcript

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Moderator: Good morning, everybody. We have a very interesting presentation this morning. Eric comes from a group called The Center for Design and Research in Sustainability, CEDARS, out of ICF International. And we have been talking for some time, and I know some of the Moffy Group and the NGOs have been talking about complexity. And I think – and especially complexity as it applies to systems, and we all look at value chains as market systems. And so what Eric is going to talk about today is are some of the lessons learned from health about complexity, about complex systems, and how to understand and measure the sustainability of these systems.

So Eric is going to present their lessons from health, and then they'd like to open that up to a discussion about how some of these lessons might apply to food security, value chains, agriculture, et cetera. So there are going to be three discussions. We have here Sitir Wenmali is also from CEDARS, and he is a fellow in food security nutrition. Sharon Arscott-Mills is a fellow in international health. And Owen Calvert is a consultant. So we'll have a presentation, and then we'll have a significant discussion.

Male: Good morning, everybody. I've been told I need to speak close to the mic, so I hope that's all right. Well, this is speaking about sustainability is always a little bit of a challenge. A complex system, also, when you combine the two, it's really challenging, and then speaking to an audience of people that are not from my original field is another challenge. So I'm going to break the ice with a little joke. So Einstein is at the peak of his career and asked to make conference with all over the Eastern United States.

And one day, his driver tells him, "Mr. Einstein, professor, I've heard you make your speech about relativity so many times, I can do it for you." And Einstein says, "Okay, I dare you." And next time they go to Yale for a big conference, Einstein takes the wheel, brings the driver in, driver comes out, everybody greets him. Remember, they didn't have Google back then. They didn't know what Einstein looks like. And the driver goes to the pulpit and makes a brilliant presentation about the theory of relativity. People clap, standing ovation, and the driver goes, "Well, thank you very much. We have time for some question and answers, and if you have any question, please turn to my driver."

So I consider my colleagues here on the right, Owen, Sharon, and Sitir, as my drivers. So they'll be glad to take your questions afterwards. So I'm going to tell you a little bit about our experience, as Jean explained. And first, to say I'm not a complex systems expert. I'm a house specialist. I have spent the last 12 years with what has become now the CEDARS Center, and some of my accomplices here dealing with the question of sustainability. But what we've stumbled upon is this question of complex systems and complex adaptive systems, and we are trying to learn as we go about.

And we think we have some impressions of places where our tools and approaches have contributed something to not only evaluating but planning for sustainability in something that's relatively complex. So the presentation should be relatively short, I hope. Famous last words. But we're going to talk a little bit about complex systems. Just – and Jean said many of you are interested in the issue, so I may repeat things that you are familiar with, but we'll reset the stage. Speak a little bit about properties of systems and how behaviors happen in this system. Then that will lead us to speak about how we've come to see sustainability in the complex system that is the health system, and we'll get some examples rapidly, but that shows highlights of where we feel we have been able to interface with this complexity.

We'll have a rapid conclusion, and then big part of this is going to be your participation and questions to you, and that's where I think it will be interested on the side of the food security and value chained people and economic development people to kind of engage with my colleagues. So that's the goal of the day, and I hope you came to the right place. So let's talk a little bit about systems. What are systems? There are different definitions, but we're talking about complex, adaptive systems, so by some definitions, what makes a system is you have a large number of agents in the system, and if you have two people in a room, it's probably not a complex system. You have a large number of agents in the system, and you have a diversity of these agents in the system. That's also part of complexity.

And then the third thing is that these agents have to adapt to each other. There's an adaptation process to each other, and there's a resulting complexity, which is not chaos. We often speak about chaos theory, and we think it the same as complexity. Chaos is not complex. Chaos is chaos. Order. We often try to bring order to things because chaos is destructive, or often is, and

complexity is hard to manage, so we try to create order. And complexity is this in between between chaos and order, and you can find it in the life sciences. You can find it in the social sciences. You can find it in organizational sciences and so forth.

That's what we're talking about, these complex adaptive systems. Diverse, multiple agents adapting to each other. And we've come to see that this is kind of what we're dealing with with health systems, and kind of a premise is that you may also find that this applies to your work. But let's talk a little bit about how these agents behave and how the system behaves. So we have a little simple graph here, and these little circles are maybe individuals. The individuals can be clustered.

They can be clustered in something that could be an organization or a department in an organization. Then some of these institutions or group overlap. You have subsystems created. That way, they overlap. They intersect. Then you have here – we've put a little system without defining too much about it. And often, in our field, in health, we're very interested about the behavior of people. We always want people to do stuff. We want mothers to breast feed. We want them to come to the clinic. There's a lot of stuff we want women to do.

The men can pretty much do whatever they want except not smoke, but women better do what we tell them to do, so we are very concerned about their behaviors, and then we're concerned about the behaviors of – for example, here we have a healthcare provider, so we're really concerned about their behaviors. And we've come to understand that there's a whole lot of things from the system and from the environment that are going to affect the behavior of an individual.

So in all our fields, we speak about the enabling environment, but there's also other things we do to affect the behaviors of these people. We issue policies and guidelines. We try to identify mechanisms to guide their behaviors, and there's a lot of focus on that. In our field in health, you have an entire panoply of tools to do that. But there's another way that behaviors are expressed in a complex system in it that all these individuals, and actually, some arrows, should

go from these bigger circles because institutions as well are in relation with each other.

They can be of different natures. It could be client provider relationship. They can be business relationships. They can be hierarchical relationships within organizational structures, and I know that in value chain and in food security, you do have a lot of these relationships. Actually, I suspect that the world you're dealing with is even more complex than the world we're dealing with in health. Health is dealt with by doctors, a very simple minded people. But your field is probably more complex, so these people interact, and they adapt to each other. If this cluster of people start to have a certain behavior, this group may be tempted to have another behavior, and this happens all the time.

And when this happens all the time over time, there's a certain equilibrium that is created. And that certain equilibrium starts to define the behaviors of the property of the overall system. So we often look at systems or we say it says inertia in the system. You know, this community or this group of maybe you're dealing with producers, processors, I don't know, in your field, but for us, it's healthcare providers and the system and the managers. The inertia, change is not happening as quickly as we'd want. There are some basic things that are not happening. Why isn't the system working? And we assume that the system is not working, that this inertia because the individuals are not doing anything.

That's actually not true. The individuals are doing all kind of things to adapt to each other, and that what they are doing is not inertia. What they are doing is adapting, is trying to survive, is trying to position themselves, their certain strategies based on what they're pursuing. But then that result may be inertia. So that's where we see the behavior of the system, the property of the system that it displays if you want is not just the sum of the individual behaviors. And so that's something we started discovering was important. So I'm going to show you a next slide. Don't be afraid. You won't have to read it or answer questions about it.

But this comes from the work of concern – an NGO that worked in Northwestern Bangladesh, and they worked specifically with health departments in municipalities, and they worked with them to set up world

health committees, and they had a very fairly straightforward intervention whereby they build capacity in the structures, they provided a lot of training, technical training, management training. They did a number of things, and with that, they tried to improve health outcomes.

And that's another caveat. Our focus is really – from the CEDARS Center, on the outcomes we're pursuing. So there's a lot of interest in sustaining organization, that it's very important. There's a lot of interest in having financially viable organizations and services, and that's critical to the big picture. But our end point for us, we're able to define it maybe because we're in health as some health outcomes. We want kids to be healthy. We want them preferably not to die. We'd like mothers to have a self-delivery and in decent quality. Those are our outcomes we can put as a high level, and then we try to look at the mechanisms to support that.

And so when they dealt with their work, _____ don't really focus at this level. Then we came and worked with them, actually. Leo Ryan, who is here, was the first one to come and help them provide technical assistance and start to plan for sustainability some years before the project ended. And then we were able to come back three years and five years after the end of the project to do an evaluation of the sustainability of their efforts. What was interesting as we did this exercise is that we started mapping out all the players that were at stake and what part they had to play in just sustaining what these guys had been doing.

And this is a map that we came up with, and that when we started thinking, "Oh, man, it's not going to be an early night if we have to understand what this is happening." So that's a point to be saying that even in a simple municipal health department, which is not providing the kind of care that a hospital or a whole district would provide, even at that level, I mean all these people were providing health volunteers were preventive care. There was no curative care of any kind. So that's very simple in terms of health intervention. When we're dealing with a sustainability, there were layers. There were different types of agents. There were ways for them to intersect and adjust their behaviors to each other.

So that gave us an inkling that maybe sustainability had to do with these complex systems. And that brings to the way we've come to define sustainability in health system strengthening, and the definition has evolved, but the main point I want to draw when I'm going to enroll this definition is that 10, 15 years ago, and maybe sometimes even recently, people tried to look at sustainability as an attribute of a program or an attribute of a service. By an attribute, I mean like say you have a program to deliver some goods, or you have a service to deliver health services.

An attribute would be, for example, the cost effectiveness. If you ask me as an evaluator, "Is this program cost effective," well, there's ways I can go about costing it and having some value for the benefits. I can put a metrics behind the cost benefits. I can compare it with some benchmarks or others, and I can give you a fairly good answer. Based on this indicator, I've got an indicator of cost effectiveness, and yes, it is cost effective on that. Same thing with quality. Is this a program that has quality? Are we delivering quality of care? That's an attribute of what we're delivering, and I can find a limited number of indicators to describe this.

And there's a lot of work in the literature to try to find the indicators of sustainability. And in health, we kind of – you'll see how we try to measure it. We do try to measure it, and working at ICF, we have to believe in indicators, but we really are not chasing for the five indicators that will tell us about sustainability. So let's go through the definition we're proposing. First, as I suggested, we're looking at it as a property of the system, and maybe it's an emerging property. We haven't spoken about emergence, but you're familiar with the term.

So we're looking at the property of a system that's embedded into a larger environment. So that means that our system must have some boundaries. We can't look at the sustainability in a vacuum. We have to say, "What are we dealing with? Are we talking with a municipality, with a district, with the whole country? Are we talking about a system that crosses boundaries?" But we're looking at sustainability as a property in this system, and it's based on interdependent actors working together. We've just seen that through the illustration before, and we have to have some negotiated and coordinated social interactions.

And there is an interface between these actors, and at some point, they have to work together. They don't have to get married, but they have to work together for some purpose. And by these negotiated and coordinated social interactions, that allows the expression of capabilities, collective and individual capabilities. And obviously, in the field of sustainability, we always talk about capacity. "Yes, but there is no capacity. Yes, but we have to build the capacity of –" Yes, but then we build the capacity, and it does not necessarily lead to sustainability because capacity is not just something you can build and then you carry it with you. It has to be made sense of and used for a larger purpose, and this leads to the maintenance or the continued improvement of the outcomes you're pursuing.

So this is a bit of a cumbersome definition. We try to simplify it as much as we can, but the main point is that we have to refocus. We can't have a health project where we intervene in your health system, and we are going to ensure sustainability. We have to find a way to interface with your system, your health system. We know that there's complexity involved. We know that we're looking at changing the property of the system, and we're going to find ways to do this.

So I want to give a little bit of the example of our approach and how we do this. But first, you know, a word of honesty. We didn't start from this thinking and then develop our tool. This is not how it happened. We're not that smart. We may not be smart at all. But what happened is that we did research, we worked with practitioners, and we started developing a tool, and as it went about, we discovered that what the pieces of the tool that worked probably worked because they allowed some interface with the system. So now, I'm going to describe it as if we had thought about it and we're very smart, but it's a ruse.

So to describe, we call our tools a sustainability framework, and we've used it in different places, and it really has two elements. One element is really a process, and I'm going to emphasize that quite a bit, and the second element is a way to analyze data and to look at the metrics we can gather. So we're going to start with the process, and you should have gotten when you signed in a handout full page of this because it might be easier to follow.

We're not going to look at it in great detail, and it's always been adjusted in different ways. But the core limits are first, you need to define the boundaries of the system you're working with. And you know, we speak about stakeholders. Maybe we speak about agents in the system, and you need to define the boundaries. You need to decide we're working at a district level. And in that system, while probably we have a district house office – what did I do? I'm good. All right, sorry.

And so we're working at another level where maybe the district, the government office of the district is one step removed from the system, and we're going to have to find a way to interact, but that's not somebody that's sitting around the table. Or as Owen likes to call it, sitting under the tree. So depending on your setting, you can have a tree or table, but you need to define the boundaries of the system, and then work at getting the right people – the people that are going to form the system, and it's not always obvious, but you need to work at that, and I think that's something that concerned it while in Bangladesh.

And then there's this idea of a long-term vision. In health, it's usually fairly easy to have a vision because we tend to want our kids to grow healthy and well fed and so forth, but it might be more challenging. And the part that's very challenging is when you start developing a sustainability scenario. So realizing we're working across fields. Sometimes we use words differently across our fields. So by what we mean here by sustainability scenario is what is a plausible way for people to work together in the long-term to achieve this vision.

And it sounds like a lot of wishy washy soft and mushy stuff to speak about visions and scenarios, but I would say if you allow a Frenchman to poke fun at the Americans for a minute, one of the biggest challenge for a sustainable healthcare system in America today is the difficulty of big side of the society to imagine a scenario whereby there's a role for the government that is not to take over everything, and you have a big debate about that in the country regarding which way you're looking at it. And so what people can imagine, what people can conceptualize plays a big part in sustaining and establishing and sustaining anything.

And that is why – and it can evolve. It can evolve. It's not that we do this planning, and then you have something, you write it in stone, and you implement it. But we found that these steps are really critical, and it doesn't have to be a scenario whereby everybody buys in and signs and says, "That's it. I'm committed. I love you." It's a scenario that's plausible. It is, "Well, there's a room for me to find a way to work with you. I'm an NGO. There's room for me to work with you as a government," or, "I represent an association of volunteers, and there's room for me to imagine working with you. I'm not sure you're going to hold your side of the bargain. I have reservation. I have my questions, but we've got a vision, and there's a scenario whereby it could work, and we're going to try to move towards that."

And then the next thing – this red zone is where we go into measurement, and I'm not going to detail those, but basically, there's a lot of work to be done to say, "Okay, what are the elements that are going to be needed to be in place for us to move towards this scenario, and ultimately, the vision, and how do we measure them, and then how do we present this information so that it's intelligible to the stakeholders?" And we'll have an example of that in the next slide. But then the next part that's very important – you see, we go through cycles of planning and measurement, is to go back to the planning and through iteration and review the results in a way that's intelligible, that makes sense to the people with whom you're working.

Some of them are very technical people. Some of them are not. I mean in Bangladesh, some people were health people. Some people were politicians who had been elected as the mayor and the chairman of the ward. So these were politicians. They had no clue about health, and yet information had to be meaningful to them to keep them on board. In this iterative cycle is really key to making sense of what we're going to do. So that's the first half of our model. The second one is what do we do with data because it's not just enough for people to sit together and sing Kumbayas. They actually have to try to improve a few things along the way.

So the next slide is just to make sure that everybody can read the one after that in the same manner. You may have seen some spider diagrams people call them or dashboard where you have different components, different directions

of measures, and then you going to measure, you know, along these six axis, you're going to measure some variable, and it's going to go from very poor to nascent, intermediate, promising, and strong. Nascent and promising are efforts to be politically correct and not say it's bad or good.

I'm not really good at this, so that's what we're going to look at in a practical example. This is actually work we did with Sharon some years back. Sharon was with USAID at the time. I'm going to go quickly about how we organized the information, and once again, the process was critical. We looked at the health outcome, and that's a first lesson from our model. We're trying to sustain health outcome, and the first thing we measure is the outcome. Been a lot of discussion about that. We stuck to this, and then now we are pretty comfortable that the right thing to do and that the outcome is part of the predictive factor for the sustainability of the outcome, if that makes sense. Think about it later.

Then we have to look at services. We look at capacity here that's capacity of the health district, which has a management oversight and organization of care services. We even looked at something that we called the viability of the health district, even though it's a government entity. We said the viability of the health district in the role it is taking here in our system is not guaranteed. Yes, there will always be a health district, but the viability of the role it is being asked to take in this work is not guaranteed, and we need to look at it. And we looked also at some community capacity, challenging thing to measure. A lot of things are challenging to measure.

And we looked at the environment, even though we didn't expect to make a lot of changes to the environment. The environment is fairly big. I mean we speak about social ecological environment here, but we said it's very important to report on it. Why? Because if we ask to speak about sustainability, then we need to be able to do it. Not just say, "Oh, there's big assumption that –" You know, we can't put the environment and everything in assumption. If we want to speak intelligently about it, we need to look at it. So behind all of this, there's a paper that was distributed. If you're curious, you can look at it.

You can see how these indices – basically, you have indices for each of these dimensions were constructed. There's indicators that were developed. I'm not going to bore you with the selection and the name of the indicators. What I want to do is just do beginning of a walkthrough. How do you answer the question how sustainable is mother and child health in a district that's called Kanchanpur and in a district that's called Rasua. And I'm not presenting five indicators. I'm presenting a little diagram like this. It could be presented differently, but does our answer provide something that's more programmatically oriented and more informative?

That's the test. So assuming that we put the right indicators behind these components, let's start to talk about this. We'll just start the discussion. So how do these two districts compare for sustainability of mother/child health? Well, first, I look at my health index, and I'm saying, "Well, if my index goes from zero to 100, in Kanchanpur, I'm at 62," so that's – I mean I don't know where my baseline was here. But at least I can say that's better than 50 because 50, I'm at the halfway point to something that's really good.

And if I think outcomes, conditions, or sustainability of outcomes, I'd like the situation to be a little bit better. Then services, for both districts about the same, and it's below the halfway point. So I'm going to say okay, you've achieved something, assuming your baseline was pretty low, but your services are still lagging behind. Now I'd want to go see what indicators lead to this result and what it means specifically. But I've concerned about your services. And then here comes an interesting part. In Kanchanpur, I'll look at the capacity and viability of the district. I'm at 85 and 60. Compared to Rasua, which is at 57 and 26. If you want to speak about the sustainability in Kanchanpur, I'm going to say, "Well, your indicators are doing a little bit better. There must be some problem with your services, but at least you have capacity in the district at some level."

So it's possible that these guys, you can – they're going to react and be able to figure out what's wrong with the services. Where as in Rasua, I mean 26, that's very, very low. Even 57, that's not great. That's a government that's main responsible for the health of the population here in this district. I'm really concerned. I mean it's not looking good here. And then we can continue, and if there's coherence and validity in the components we've selected, we can provide a more richer answer to the question of how sustainable is it. Now we

may not be able to give an answer that's yes/no. We may not give a single number. You could if you wanted to, but I'm not sure what it would mean.

But the point is that you can give an answer that tells the agents of that system, "Okay, what do we need to do if we do care about the sustainable outcomes?" And if you are a donor or if you are the project that's working with these people, there's some possible programmatic orientation to okay, that's what we should be looking at.

So I want to go back to – we've done this. That was done in Nepal. We did the same thing in Bangladesh, but I want to go back. We're getting close to the end. I want to go back to the example of Bangladesh. Remember this complicated network that I showed at the beginning, all these different players? Well, I want to look at how change happened. We were fortunate enough to go back to Bangladesh five years later, and we saw how health outcomes were actually maintained. Not everything was maintained. We saw how these different things that we've been measuring here, some of them went up, but overall, five years later, we had pretty good results.

I mean their concern was pretty proud. They made a nice brochure about it. So how did that happen? How did change happen? Traditionally, we have to have some linearity to plan our projects because otherwise, it's very hard to know what you're doing, and we expect that some people put in outcomes, some attributes of the program which would be sustainability or say, "Well, if you do that over time, they sustain impact." So that's how we tried to look at things.

But in Bangladesh, for example, I can cite three things that were totally unpredictable, unplanned, and that had substantial effect on the sustainability we observed. First negative thing that the ministry of local governance, that was the government entity that had the policy in place for municipal health, they failed to staff the health officers they called them. That was a negative thing. But what happened, there was such dynamics created in the municipalities towards the pursuit of these goals and looking at data and everything that a staff one step below health inspectors in both municipalities took on greater role and just kind of jumped to the task. Sample size, too, but

there was an amazing process that happened in these municipalities in these health inspectors taking a new role.

The second thing that happened is we had an army of health volunteers, and then all of a sudden, the municipalities over time had to hire some staff to be in the municipalities, and they were going to go and hire staff outside of the cities. I mean Northwestern Bangladesh is fairly deprived. Human capacity is a little weak. And the health volunteers that started creating an association, and the municipalities we are looking at doing and hiring staff, and then there was kind of a back and forth. The municipalities were not crazy about volunteers having an association, but the volunteers were not crazy about the municipalities hiring people outside.

And they came to an agreement, and the municipalities trained some of them and hired some of them. It was a few handful out of hundreds of volunteers, but all of a sudden, these people said, "Well, we can work that way. At least some of us will have a job and progress professionally. This can work." And this kind of built some of the equation. And the third thing that happened is there was a large missionary hospital by the Lutherans that had been there for 50 years and basically taken the stance of, "There's no point working with the government. At least we help people," which I think is very legit in many places.

And after observing what had happened for six or seven years, this hospital started saying, "Well, want to do a more primary healthcare, and it looks like the municipalities are getting serious," and these health inspectors that wanted to show that they could take the job of the health officers said, "Well, we need help. If concern is bailing out, wouldn't it be great if these guys helped us?" And by the time we came five years later, there was a strong partnership with that missionary hospital. They were providing training. They were providing a lot of capacity, and the municipalities had just rolled that up in their coordinating mechanism.

So there are three things that we could identify that were not planned and that significantly contributed to the sustainability. So maybe a little model here does not create response. So we suggest here, and I'm going to conclude quickly after this, I need to hurry up, something that's called a complexity cascade

where basically, you look at time this way, and you say, “We spoke earlier about an equilibrium.” There’s an equilibrium in how agents interact. And then at some point, this equilibrium is punctuated. There’s a change, something. You come, you intervene with money, or there’s a shock to the system. The equilibrium is shaken up.

And then the question is do agents find another level at which they can find an equilibrium, or will they come back? And in Bangladesh, it happened. By the end of the project, there was a new equilibrium. The concern pulled out. That was a shock to the system. And somehow, through things that were planned for and things that were not planned for, they found another way to interact that created another equilibrium. And so the range of possibilities for the agents increased little by little, and with that maintain the outcomes. And that’s probably more faithful to how change happens.

Now a conclusion slide about how do we feel like we’ve interacted with this. Well, I said we have a process that’s at the center, and we described it, and this learning process is essential. Then we use data. This data have to make sense. It’s not easy to pick the right data. We still have to struggle to get indicators. Making spider diagrams is easy, having indicators that are meaningful behind. That’s a hard part. But basically, this data that can guide action, and the tools, the learning process, and the look at data are interrelated, and there’s an iterative cycle. I think an important thing is consistency over time.

Consistency of purpose, consistency over time. I think we’re so project driven, it’s very hard for us to have consistency, but I think it’s a fact of human life. And I think through all this – I mean we could almost summarize it information based decision making. That’s a key point. Shared accountability. I mean when Bangladesh got people around the table, the mayors didn’t become humble and meek all of a sudden, but they did have to come to the health volunteers. There was a shared accountability. It’s not all or nothing. It’s not a horizontal society that’s created overnight, but there’s all of a sudden, we’ve agreed on some vision. We’ve agreed on something. How do we go forward? This shared accountability. Lateral learning and sharing. The fact that there were two municipalities and that they would compare results together.

All of a sudden, there's learning across. That's important. The consistency of purpose, of course, over time to be committed to what you're doing, a workshop usually does not change the world. But – and then multi-level decision making, I guess, going back to point of the information based decision making, but at multiple level. And I think all these elements kind of contribute to the formation of social capital, this kind of thing that's hard to look at, and probably, that's a big part of in our definition, we're told sustainability is these agents interacting together, having negotiated roles, and working towards a public good that allows the expression of collective capacity to sustain outcomes.

I think this kind of is a simplified way to look at how these different pieces work together in our model. So we're going to turn over the discussion to you. These are some good resources I suggest if you're interested. But to open the discussion, and you know, I'll have my colleagues join us. Big questions are does this apply to your work, are there elements of this that apply to your work to value chains to sustaining food security? And then if yes, how do we go about it? How we go about balancing learning and building of social capital with getting results. Those are some of our big questions which we struggle with.