David Moinina Sengeh

Hi everyone, my name is David Moinina Sengeh, I'm the Minister for Basic and Senior Secondary Education in Sierra Leone. And I also serve as the Chief Innovation Officer, leading the Directorate of Science Technology and Innovation.

And what this means is that I am both responsible for the policy, and innovation within the education sector, basic education sector, and in shaping the agenda for the technology, and innovation as well. The DSTI, the Directorate of Science, Technology and Innovation sits in the Office of the President. And essentially, it has a vision to implement the national development plan, through science technology and innovation, and also to help seed an innovation and entrepreneurial ecosystem in Sierra Leone.

Whereas the Ministry of Education is really looking to re-shape itself to focus on providing 21st century skills and learning to children and to support teachers, such that the beneficiaries of higher education can grow up to reach their highest potential, and be able to contribute in civic life and the national and global economy.

Sierra Leone's priorities is focused on human capital development. And that's at the intersection of health, education, and food security. And when we think about HCD, which is the President's priority, and in fact, our national development plan is titled Education for Development, and the first pillar there is HCD. When we think about HCD, it really, for us, is about how we connect solutions in education, solutions in health care, solutions in nutrition, and food security, which are all intertwined, for the development of a person's full human potential. And there are multiple ways in which, as a country, we have focused on doing this. And at the core of that is science, and technology, and innovation. I'll talk a little bit about two things today.

One, I'll talk about the National Innovation and Digital Strategy, and then I'll talk about how Sierra Leone has been using data and analytics, really to support our engagements in the fight against COVID. I also serve on the Presidential Task Force for COVID. And so I get to, link all of these different things.

So the, the National Innovation and Digital Strategy is a strategy document that the President launched last November, and it essentially has a philosophy of digitization for all. We believe that digitization, which will allow for people to not just access data, and information, and knowledge, but also to create, or to be content producers, and to be developers and because this links to what will happen for a year, has to happen for all. And

as a country, we're thinking about what we need to do to ensure that this is true, particularly for people at the edge. And when digitization happens for all, we want to be in place to ensure that the economy, the identity, and governance becomes digital. And the processes, the principles, we call these principles. We have three principles.

One principle is mobile first. Now we all know that mobile penetration in Africa has spread very rapidly over the last couple of years, and it will keep growing. And in terms of households' access to mobile connectivity, in Sierra Leone, we are hoping to keep expanding mobile penetration, which is about between around 85% at this point, and keep reducing the cost for data, such that the solutions we build are going to be readily available to function on mobile. Whether that's voice and texts, or data. The second principle, this country as A-Lab. The A there is AI lab, so country has AI lab. for us, that breaks down into Applied Data Science for Governance, actually, and so how do we use data science for government decision making? And I can give you several examples of how we have done that in education. And more recently, we worked with some partners to build models for a hundred meter by a hundred meter grid population estimate informed by a spatial satellite data that we got from our, from Digital Globe and, and the national census. So the national household census of 2015, and the satellite image data from this year, was combined to bring high-resolution population estimates that we have been used for, planning during COVID.

The next thing we do is Evidence Based Policy Making. Now it's, quite common for people to make policies based on their gut feelings, or based on history, or based on their perception. And a lot of what we want to do in Sierra Leone, and in government is to use evidence to inform our policy, and that evidence can come from several other countries, but also from experiments that we do. So in education, for example, like at DSTI, we have what we call the Education Innovation Challenge, and that really is bringing about 10,000 students, in about 370 or 340 schools... 170 control, and 170 experimental, where we are testing several innovations to enhance learning and how people are learning. And we automate the evaluation of those using the ACER test, and EGRA, EGMA, and build models to see what we can scale and what government needs to scale. And a third component of the country as AI lab is Citizen Centered Design. Now it does no goods to develop solutions and policy that citizens are not using. And for us, the reason when you're in government, obviously you tell your citizens that you're there to solve their problems, and so the solutions that we develop has to be focused on, on citizens. And remember, I said, well, maybe I didn't say, but for DSTI, It's both the entrepreneurial ecosystem, and citizen engagement is a pillar that we care about.

And the third principle is Hybrid Technology Systems. Now this really means that

everything we do has to work online, offline has to work on web mobile, and, Or paper, and it has to be, when theres power and whend theres no power. And for us, we believe that the way in which we can enhance the maximum impact, and reach for our people, particularly those on the edge, is if we develop Hybrid Technology Systems. And it is at that edge that we can also innovate, because if you are able to solve how to bring vaccines for people who are across the river line area, such that they don't miss their vaccine period, then you're going to have to think about how to communicate effectively with that mother, who may or may not be able to read English.

How to ensure that the health worker has a vaccine at a time that may or may not be raining, where there may or may not be a boat to cross to reach them. You have to be able to solve these logistical problems all fully, to be able to have that impact, so that these principles really mobile first country, has AI lab and hybrid technological systems, are to enhance our digitization efforts. And there are several... examples that we gave in terms of applied AI for governance. One is using AI to understand the effects of school, and students and teacher attributes on learning outcomes, and using AI and remote sensing for monitoring development and the impact of environmental interventions to better manage our resources. And as I just, said on population estimates as well, and a lot of visualization and, and machine learning components as well. In healthcare, now as I move to health care, there are several general things we can do from applying data science methods for diagnostic imaging or genomics, which has become very critical during this COVID fight, cause we do use PCR testing.

The idea of mobility and environmental data, which also has an impact on healthcare. How do we combine all of these different-- How do we combine all of these different analytical methods to ensure that we're able to provide healthcare for people who need them the most? How do we predict disease outbreaks? How do we enhance disease prevention and identifying high-risk-- For better resource planning and mobilization. And how perhaps can we use, British Community Entomology approaches, to facilitate.

For us maternal and child mortality is still a major issue, but how do we do that in a comprehensive and sustainable way. For the COVID-19 fight, DSTI has been joining with the Ministry of Information, private sector, Ministry of Health, and several other entities to develop solutions. And we leave the ICT and data pillar, to support our work is DHIS too, so the District Health Information System that has data on all labs and cases, and case management. And our team here, and our partners, are looking at how we can analyze those data to see once we-- But with our intervention that we use, but also now it's also use that for effective planning. And it's quite interesting cause at the very early part of evolution of our interventions, we used-- everybody talks about lock downs, and people

made lock downs as if you just could it lock down, because this is what you wanted to do. And we did not follow this, we tried to customize our lock down to focus on our own ability.

So we had a survey that had gone out to where people's preparedness and readiness to be able to have food for more than three days... or not. We had looked at the traffic flow from outside Freetown. The geography of Freetown is a peninsula, and so we have a toll road, that shows the flow of traffic from there. And we also have telco data to talk about mobility of people.

And so we were able to use whole components of data, to not really have a nationwide lockdown. We did have effective inter-district lock downs, and we... Had that for a long time and also look the curfew. We curfews, I think we still have curfews, and we just lifted the entire district lockdown recently. And so the, principle of lockdown, when everybody, everybody was asking for, Oh, it has to be 14-day to download 21 days. People were trying to second guess how the policy was being made. But the one thing that was very clear for us, was the policy, was primarily informed by data, and the President put together Scientific Technical Advisory group on an emergency.

And we also periodically use recommendations from stage in the presidential task force, to inform and enhance our decisions. So when we talk about challenges and ways, which we can use AI for healthcare improvement in Africa...

For many, it may seem like it's a futuristic thing or it's a privilege. And I do want to challenge us to realize that this is happening in Africa, this is happening in Sierra Leone. And we are hoping that these solutions that come out of these engagements are really focused on the humans, focused on the entity, focused on the impacts that we're making and the collaboration between private sector, government and policy, effective policy decision making with rigorous science and technology, and form that driving impact is the only thing that we can use and can rely on, for driving the change and the impacts that we need.

In Sierra Leone with the rollouts, and the continuation of our National Innovation and Digital Strategy. It's a tenured document, with the engagement of the COVID EOC, the Emergency Operation Center. That would be a part of as DSTI, and a couple of the other technical entities. We are absolutely excited to see, that there are challenges that... Seeking to enhance that collaboration, and to drive the entrepreneurship, and to underscore the need to, to strengthening local capacity.

And, before I end, I do wanna say, a lot of times we see, well, the humans are in there, and in parts it's true. With the right skills. And so one of the things that we've done in Sierra Leone is we've partnered with Coursera, and were able to launch a skills development program that has made about 3,800 causes available for free, with certification for about 50,000 Sierra Leoneans. And so university students and people in public sector have been joining as well to up-skill and learn and, and engage. So there are many ways in which we can partner as, as... as international and local organizations from public sector and private sector to ensure that we can deliver on the impact and the outcomes that we want.

So let's get it done and let's get it done with science, technology and innovation. Thank you.

What advice do you have for researchers?

As a researcher, I always looked forward to meeting policy makers who, understood research, who I would just, who should take my idea and expand it at scale. You struggled to find one of those. And I was frustrated, like many researchers are often frustrated, but a couple of continued doing that work anyway. And then when I became a government person, when I became a minister, and the Chief Innovation Officer, I then was looking for researchers who wanted to stop at scale. And I often found that I was like, no, come to us, We, I understand this stuff, my people understand, we can code too, we can do research. And there was always a struggle, it was almost like I was cutting this weird space where, I used to beg for this opportunity, and I'm offering this opportunity, come, let's do this thing. And maybe that's been my biggest frustration in the job. And so my, my request, really, to researchers and academics who have this goal and a vision to try and impact that they believe in, is to not stop, not lose hope. Finds a policymaker who maybe understands code a little bit. So who you came convince to, to, to test some hypothesis with you and then go for it? I think we often are limited, by our own imagination sometimes. Like it's still good to be true. Most times it's too good to be true, and sometimes when it's too good to be true, you should just do it anyway, because it's too good to be true, so why not do it? And I feel like it's, it's one of those things that as a research, as who particularly seeking to take advantage of these collaborations and opportunities, we must be mindful of, because we don't wanna implement things that are too good to be true, that are gonna waste everybody's time. But when it's too good to be true, that you're talking to a policymaker who understands daytime research and is saying, yeah, come let's do it, you should do it. And I think it really is that, we as researchers have it difficult, but I suppose that's why we're researchers.