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Access
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>>AMR BADAWI: Okay. Good morning. I'd like to announce the start of the access session today, and I'll be chairing the session. I'm Dr. Amr Badawi, executive president of the National Telecommunication Regulatory Authority in Egypt -- i.e., the telecom regulator here -- and I'm pleased to have an excellent set of panelists today, and our moderator will be Dr. Hopeton Dunn, the director of the Caribbean program, Telecommunications Policy and Technology Management in Mona School of Business, University of West Indies, Mona, Jamaica. Mr. Dunn. Dr. Dunn.

>>HOPETON DUNN: Thank you. And good afternoon, everyone. Can I ask you to take your seats as we are about to proceed with this panel which follows the previous one dealing with issues of diversity and access.

This particular panel will be dealing with matters relating to access, and I just wanted to start the process by making a few remarks of my own, and then to introduce the panel, and thereafter to take the opportunity to respond to your questions as they come forward.

So for starters, let me thank you, Chairman, and welcome the participants and the panel to this session on issues of access.

This matter of access has been among the matters of highest priority, right throughout the entire WSIS process. In fact, it's a process that I participated in and followed, and within the documentation out of the Tunis phase, we had very many and very strong declarations in favor of supporting access on a global scale.

For example, in the Tunis declaration, it mentioned that we are resolute to empower the poor, particularly those living in remote, rural, and marginalized urban communities, to access information, and to use ICTs as a tool to support their efforts to lift themselves out of poverty.

When we speak of access, we are speaking not only about the physical ability to connect with a network, but we are talking about a great range of additional means by which access is to be attained.

We are talking, colleagues, about financial access, the ability of people to afford the content, to afford the connectivity.

We are talking about the essential nature of literacy to access, including information literacy, all the cognitive skills associated with being able to use the network.

We are talking about access to relevant content. We are talking about access to institutional support, including political access and a voice. We are talking, as we did in the previous session, also about linguistic access and access by the disabled.

So these considerations are the ones that help to frame our discussion today, and we are fortunate to have a very engaged and outstanding panel of presenters, and I would like to introduce them one by one, so that as their names are called, we will have a short presentation from them, giving us an opportunity to then engage in the dialogue which we expect thereafter.

Our first presenter is Mr. Ben Akoh. He is program manager, Open Society Institute, based in West Africa. I'd ask Ben now to make his presentation.

>>BEN AKOH: Thank you very much, Mr. Chair. It's an opportunity to be here

and talk about critical access-related issues.

I think global debates on access have moved from just infrastructure-based arguments that we've with always had to issues of policy, regulation, and rights. Not like infrastructure is not important, but infrastructure such as undersea cables have finally begun to arrive to underserved coastal areas. There has been increased mobile phone proliferation, which have characterized most of the landscape in our countries. We've seen previously where copper cables didn't exist that mobile phones have been able to take the spaces and enable communications. The tele-densities in most of our countries, especially rural areas, have also increased and continue to increase.

Even with these advancements in infrastructure, there remain certain challenges, and some of those challenges include the fact that landlocked countries still continue to struggle to access coastal cable infrastructure. Broadband remains a major challenge, still.

Either traditional broadband as it is or broadband on the mobile phones as we are hoping would begin to happen.

The rights to a landing station continue to pose problems to cable companies that are seeking to land infrastructure as they pass by coastal cities.

The cost of making phone calls and sending of simple messages as SMS messages still remain -- still results in approximately 50% of disposable incomes of most Africans or most underserved people. In literal terms what that means is it's a sizeable fraction of a day's wage of a Rwandan farmer. The difference between the current state of access and the future progressive opportunity for all states, which is the theme of this conference, remains with three critical and strategic moves, and those are: Policy issues, regulation, and rights.

Appropriate steps have to be taken to address these three issues, and how we deal with them will determine what progress will be made in the coming years.

The access debate has moved, like I said, from infrastructure to these issues. And these issues stretch around several things which I will focus. But I will focus specifically on one of them, which is spectrum. And I feel that spectrum is the lifeblood of infrastructure, of telecommunications, of access eventually.

Until these issues are handled appropriately, and effectively, within the spectrum space, we will not have efficient, effective, and optimal use of the infrastructure, so basically you will have all of this infrastructure with all the connectivity coming in, but if you do not have the language to plug into them, to enhance or enable connectivity, we would not be able to utilize them effectively. So we must begin to see spectrum and its management as a major and a fundamental component of access.

But I'll talk about it from three key perspectives.

First of all, is reclaiming unused spectrum space. I don't think that up until now, there has been a move -- an initiative to make sure that we reclaim the spaces that may be available within the spectrum bands and the way they have been managed so far. I think it's important that, first of all, we begin to see -- make moves, specific moves, in terms of reclaiming such spaces and I'll make a couple comments around those.

Secondly, I think it's important to effectively leverage the benefits of digital dividends. There is a switchover that would likely come in the future and how do we leverage the dividends that will come from that. And thirdly, specific advocacy and policy recommendations need to be made in terms of how this is handled.

Now, talking about the reclaimed unused spaces, I think one of the things that we need to begin to look at is managing spillovers and maybe guard bands.

Spillovers are out-of-band emissions that happen within a defined frequency, so in a spectrum space, for instance, if you cross from one country to another, there is a momentary period where the signal from one country tends to interfere with, you know, the signal within another border space. That is a spillover. And now there's a lot of infrastructure, there's a lot of cost that is put into managing that sort of regulatory issue.

It's about time we begin to look at ways by which we can allow perhaps such spillover to happen and find better ways of managing cross-border spectrum or spectrum harmonization, so to speak.

Guard bands, on the other hand, are free -- are bands that have been kept by -- within a spectrum space to allow for -- or rather to accommodate interference by alternate bands and it's important with the new advances in technology, with the new ways by which transmission and receiving devices can connect and negotiate how to connect with themselves, it's important that we find ways of reclaiming those guard band spaces. Eventually they will make more spaces available within the spectrum space.

And thirdly, digital dividends. The benefits of digital migration is digital dividends and stakeholders have claimed that it will lead to more available spectrum spaces. Further, through innovation and compression, these spaces will be optimized, resulting in more available spaces. Effective technology such as agile or software defined radios will encourage further innovation and better and efficient utilization of this available spectrum. The bottom line is that there will be more spaces available for more applications, but this can only be true if, and only, when specific measures and steps have been taken to effectively and collaboratively plan the potential spaces that will result from digital migration or switchover.

Ultimately, the spectrum management mechanisms and methodologies, policies, and regulations of the past may not be sufficient for these future spaces. New mechanisms are required as the factors have changed somewhat. Basically, it's a specific case of pouring new wine into new skins. So what proposals do we have?

That these issues of policies on access -- that is, spectrum and infrastructure -- should be looked at, one, as a rights-based issue. Access to spectrum should and must be couched under themes such as access to information or even freedom of expression. Certain policy measures on cross-border spectrum needs to address public good, rural development, and underserved areas. More so, as reclaimed spectrum bands can and should be reserved and specifically targeted to address broadband deployment of underserved areas, for instance.

Secondly, we should begin to see this as a social responsibility issue. Social responsibility of current spectrum administrators or regimes to their citizens, requiring that provisions are made to incentivize service providers who will utilize these reclaimed spaces and available spaces for broadband rural connectivity.

I'll leave those few remarks and hopefully during the interaction -- interactivity of the session, during the session, we will be able to talk some more about some of these issues. Thank you very much.

>>HOPEYON DUNN: Thank you very much, Ben. Those are critical issues as part of the consideration of access. In the Caribbean, where I'm from, and certainly in Jamaica, where I serve as chairman of the broadcasting commission, we are concerned about the switchover from analog to digital creating more opportunities for people in this particular digital age. So thank you.

Our next speaker is Pierre Dandjinou, specialist and consultant in ICTs and e-government working at and being CEO of Strategic Consulting Group in Senegal and Benin. Pierre?

>>PIERRE DANDJINOU: Thank you very much, Mr. Chair.

And I'm honored to be here and to be actually presenting this, and I will be talking on mobile broadband, and definitely a question that was put to me was, is the whole hype around mobile broadband justified? Especially in regions such as Africa.

So what I'm going to do is maybe take a much more holistic approach. Ben alluded to this better management issue. I'll try to actually deal with it in -- well, coming from the developing world having, you know, assisted different countries in Africa to develop their own strategies, what they call e-strategies, and having observed that, most of those strategies were actually shelved and were not actually implemented, sometimes for lack of appropriate

funding, also for lack of realistic agenda. It seems to me that we need to have a switch in the -- what I will call the paradigm, connectivity paradigm of today. So I will try to kind of go through the technology and a few applications that exist, the issues that are there, and also some of the way forward, especially for developing countries.

Before I move to that, I would also like to recall what Mr. Subramanian, vice chairman of Tata Consultancy Services was saying at the opening ceremony. You'll remember his Gopal story, a poor Indian farmer, and the potential that access to information held there for him. And for him, it was about, you know, death or life.

I think if we consider the Gopal story, and if you come down to what we are observing, there are many studies there, especially from OECD, to name a few, that really indicates that access to information and communication technology has a direct and measurable impact on social and economic development.

Therefore, if you also consider the numbers that we are having today -- and we do have more mobile telephone users in Africa than Internet users, for instance -- that may be the paradigm to switch to that one, that we should really be talking more on national backbones, but not necessarily -- or not only the fiber line, but also the mobile.

And for that, in fact, the idea is that it will open up more opportunities. We are talking about social economic development, but it is also about education and health care as well as social inclusion.

But basically what is broadband technology? Of course it is the name that is given to describe the step of wireless high-speed Internet access through a portable modem, telephone, other device. And it is interesting to know that the technology is still there today. Because various network standards may be used, such as GPRS, 3G, Wi-Max, LGE, and ASPA. And also the good news is that the business has come up with this sort of common platform, which is now known as the 3GPP which is the Global Third Generation Partnership Project. So this family of standards actually provide the technology, and actually 90% of the world's mobile subscribers now are using this today.

Now, how about mobile broadband development and adoption? We notice that especially developed countries actually have already set up their own strategies for developing this mobile broadband. And in the U.K., for instance, since October 2008, the aim is to have 100% broadband coverage, with a minimum speed of two megabytes.

European Union also have taken a few steps, and recently they have outlined the Internet innovation strategies which encompasses, of course, the right to the Internet, right of the users on the Internet, but also the right to broadband.

And actually, as Ben was saying, one of the features they are having there is to use those airwave that will be liberated to actually gear them toward broadband access to a larger number.

Now, how about Africa is the mobile broadband? Obviously, it was quite surprising to note that most purpose, most thing we are reading today are saying that Africa and the Mid East are going to be where it is going to really happen.

And just because those places, of course, have been sort of kept away from the Internet access for so many years. But also that the mobile, the mobile uptake is so phenomenon that this is definitely where we are going to have the most modern users of this mobile broadband technology.

And figures are there to show that, well, from the current 1 billion that we are having on this mobile telephony in those areas, Africa and Mid East, we will have something to -- we go up to something like 6 billion in the next two years.

Of course, cable already in Africa. And we are talking about ten of them that are trying to wire the continent. But it is about international gateways.

It's quite interesting also to note that as you travel in places like Mauritania, Senegal, Kenya, you will also have access to this mobile telephony through the CDMA's that are being laid out all over the places.

So definitely we notice that 2.5 million, of course, mobile broadband users,

especially on ASPA today in Africa, but it is estimated that that number is really going to be newspaper the coming two years.

Places like Rwanda already actually are using part of this technology, especially for e-health promotion.

Now, this mobile broadband technology come with, I'll say, a few issues. And I think that what's important now, is if we talk about access and if you are serious about opening up opportunities to remote areas or rural areas, for instance, we then need to consider those seriously.

Of course the issues actually get into market structure. Meaning what type of model are we going to use here in Africa or developing worlds, per se? Certain that the single subscription equals single customer model that we have in developed countries will not be appropriate in Africa, but that we can still discuss.

The other prerequisite, of course, is the whole spectrum challenge, how we do free the spectrum and how we do manage it. And Ben commented on it and I will not come back on that.

But there is a fundamental role for government and regulators. And I will say that they need to facilitate and adapt. And how do you do that?

If you go through the way liberalization of telecoms has been done, especially in the places you are talking about -- you know, Africa, for instance -- most people will say that has not been a success. For many reasons, actually. And of course I will say the importance of having the right license fee structure is important.

In many places, the aim was to -- it was very expensive, you know, to buy licenses, highly in other places it was just a simple administrative charge.

In fact, in the long run now you have to consider what you are gaining. So we are calling for the importance of revisiting the right to license in the structures.

The other thing is the taxation that we have, which is actually holding back deployment in most places.

Universal access from -- somebody was saying, well, we just need to suppress them the way they are today. Because there is money there. Nobody is really using them the way it should be used. So definitely there is a way to getting this access for larger number.

Last, but not least, is the power issue. I'm not going to go into details for that, but operators of mobile in Africa, for instance, know that this energy from a big, you know, part of the expense.

The chair is actually urging me to a conclusion.

I am just say that, will, that as we observe the situation today, we consider the technology exists. We can also say that the needs also are there. And the applications also are possible and potential.

So the issues we need to solve. But we cannot solve the issues if we don't have what I will call sort of a holistic approach.

So the message is going to be for government and regulators, for instance, and all stakeholders to come up with what we might call insurable mobile broadband strategies or policies that really include the following. Technology neutrality, security and private issues, transparency issues, especially in managing the spectrum, tax policies, what I will call renovated universal service funds, national and local content development issues, competition, and finally the energy issue.

And with that, Mr. Chair, I would like to enter my remarks. And of course wait for any questions to elaborate on the issues.

Thank you very much.

>>HOPETON DUNN: Thank you. Thank you Mr. Dandjinou.

Let's give him a round of applause.

If the next billion are to come mainly from the global south, then what are the policies that are at play in the global south and the global north in relation to these matters.

Our next speaker is Mr. Mohamed El Nawawy, vice president of telecom Egypt. And he will share with us some perspectives from the Egyptian context.

>>MOHAMED EL NAWAWY: Thank you, Mr. Chairman.

So our presentation is addressing access, and specifically infrastructure and submarine capable infrastructure, to be specific.

Egypt is in the cross-section connecting the Asia to Europe and has been playing a predominant role in connecting all the infrastructure that goes from Asia to Europe over the last few years. With the boom that is happening in Asia, many more projects are coming up, and this connectivity role is becoming even more important.

To date, nearly 300 gigs of traffic are going on these routes, which represents the fact that there is a modest amount of infrastructure in place. But if we look at how this graph is growing, we can see that over the next ten years, we are expecting to reach a good nine terabits of data. Just to put things in perspective, nine terabits of data is approximately two and a half times what is going over the Atlantic right now.

Just a quick survey of what's out there. Certainly SMW3 and SMW4, substantially important consortium systems that have existed for some time. Perhaps SMW4 is the first system that was designed with the Internet in mind. You see it is shorter than SMW3, which was considered to be an innovation at its time, reaching very different Asia-Pacific, going into the strait around the Iberian Peninsula and reaching Atlantic Europe. A very important system, but a very modest, small system, not really ready to handle Internet traffic. Although it has played a very important role in some of the adventures we had in 2008.

Newer systems are also coming up. IMEWE and EIG are both consortium systems. They are similar to SMW4, shorter in path, starting in India, ending somewhere in Europe, although EIG followed the SMW3 path connecting to Atlantic Europe.

And both are Internet ready, very dense systems with about 3.8 terabit capability. This is another look at private systems. So for example, flag very famous system that starts deep in Asia-Pacific, continues all the way to Atlantic Europe and all of these systems in common they have the fact that they pass through Egypt.

Another system that is also a private system is falcon, which gives great arraign bean peninsula and Arabian gulf coverage, and meets needs of south Europe and Suez about 300 kilometers from here.

Another system coming up is ten. Ten has the design capacity to be the first system in the world that is ten terabit capable. And it's, again, designed predominantly for IP transit. It connects Egypt to Europe, and is the first of a new breed of cables which is acting more like a conduit for traffic and for other infrastructure.

With the cable cuts that happened in 2008, we started looking at diversity in a more granular way. So rather than just look at the physical diversity across Egypt and the physical diversity across Mediterranean, we are also looking at how we access Europe. And certainly accessing Europe from the east is becoming more important, and especially after what happened in December 2008 where nearly six cables were cut in the northeastern part of the Mediterranean.

An important development which I share with you with great enthusiasm today, as my colleague Mr. Akoh was mentioning about coastal states in the east coast of Africa not having access to fiber, I am excited personally as a person who worked in the Internet field for a long time to see the first fiber system coming out of South Africa extending east to the north, connecting to Egypt in the south, dropping in about eight different coastal states, and providing the first fiber to the longest coastline in the world, which is the Africa coastline.

Egypt today stands today to be connected with dive fiber connectivity to approximately 60 countries in the world or a little bit more.

Again, talking again about infrastructure, we take diversity very seriously,

and when we look at diversity in a granular way and we look at what's happening in the Mediterranean, we divide things in the Mediterranean in a simple way. Is it above Malta or below Malta, north or south of Malta. As you can see, Malta has a very unique position and is very close to the Sicilian strait which is a very narrow passage of international water between Tunis and Sicily, and there is a lot of cables going there. And this is why accessing Europe also through Greece, accessing Europe also through Turkey, further to the east, is becoming a very important addition. Important enough that to make sure what happened in December 2008 is not repeated again.

This is another slide that is also showing the issue of the Malta diversity and the importance of rearranging the systems that go through this particular point.

Again, we take diversity to another granular level which is in terms of access to Europe. So a lot of aggregation of access is happening in Marseilles in France and this is important that we move eastward and westward of Marseilles and certainly new access points are happening in Monaco, in Pointe Rouge which is about four kilometers east of Prado Beach. And also in Europe, places in Sicily, like Catania, and also even further east beyond that in Turkey and also in using Cypress to build an environment of fiber, protected fiber with different states in the region.

Taking diversity again in a granular approach, below the Mediterranean, across Egypt, as you can see the fiber that goes across Egypt that carries this traffic is inherently very diverse. You can see that many of those systems use different paths, a north and a south path. In order to make sure there is protection.

And, in fact, much of the world's IP transit is happening here which puts another idea for the challenge of access as our moderator was talking earlier about access does not just mean structure. It also means cost.

This amount of Internet traffic that is passing through this fiber, in this little geography, is really bringing up the issue that we plan to challenge the need for IP transit versus IP peering. With enough traffic happening in this region, we wonder if very soon this would become an important enough network access point for the rest of the world to consider to peer with us, and hence help us reduce our cost of Internet access. And certainly make things more affordable for everyone.

By meshing this infrastructure, we can take things to another level of protection. You can imagine, rather than having two routes for every cable, you have as many routes as there are cables. And accordingly, the production can be taken to an end level rather than to a one plus one level.

This is a slide that shows the activity that happened in the Mediterranean. It's taken from the Web site of Alcatel. It shows the cable cuts that happened in the east near Catania and then further in the west near Matsara (phonetic) and affected about six different cable cuts. And certainly this was a very big adventure for some of us. And it also brought up many questions. Some questions have to do with what preemptive policies can be put in place in order for the marine activities around this region to be happening in a more controlled way and also brings up issues like if this can be done, well, what can we do in order to access Europe in other ways, and depart from Egypt in other ways.

And I have one last slide that I can share with you which is a picture of an anchor of a ship. A ship that was dragging its anchor for nearly a thousand kilometers until it hit a pipeline and caused much more damage than just hitting fiber. And the amount of damage it did to the sea bed and the effect of that.

It's another policy issue since we are in the Internet Governance Forum that we can think about.

Thank you very much.

[Applause]

>>HOPETON DUNN: Thank you very much, Mr. Mohamed El Nawawy, for pointing out some of the physical connectivities to North Africa and, at the very end, the

important issues of the environmental implications of some of these matters of connectivity.

Our next speaker is Mr. Ernest Ndukwe. He is the chief executive officer and executive vice president of the Nigerian communications commission.

Mr. Ndukwe.

>>ERNEST NDUKWE: Thank you very much. I would like to first thank the Egyptian authorities for the great arrangements that have been made for us since we came into this beautiful city. And also thanks to the organizers for this opportunity to speak.

Let me start by saying that access is very fundamental. Without access, there will be no Internet. And Internet is not real and cannot be experienced, used, or valued by the individual or groups that do not have access.

Access, to me, means being connected to the Internet at the right speed and at the right price, and linked to the right content at the right time and at the right place.

For the interest of time, I will restrict my intervention to the enabling infrastructure, especially with respect to regional and national backbones as well as security and safety issues.

I think it's true to say that many developing countries lost out on the telecom revolution that happened before the advent of mobile communications when the rest of the world developed copious installed capacities for fixed-line transmission and last mile or last meter infrastructure.

With the coming of Internet, and of course the commercialization of the use of Internet, the cable infrastructure became the access infrastructure in those more developed countries for linking homes and offices to the Internet employing ADSL technology.

Thus, for many developing countries today, last market, last mile, or last meter access to the Internet has to be wireless. We can talk about the new technologies, UMTA, WCDMA, Wi-Fi, wi-max, satellite transmission, and of course terminal systems like the mobile phones, PDAs, and the like.

It is also important that last meter access is developed side by side with national and regional backbone infrastructure to ensure affordable bandwidth costs and interconnection and interlinking and peering.

Regulators and governments must have a responsibility to encourage investment in building of large capacity, optic fiber infrastructure within their national boundaries and across the region.

I was in a meeting recently where I tried to launch a campaign for what I termed fiber without borders. This followed the realization that some countries in Africa, especially in SubSaharan Africa, delay or deny rights, rights of way for cross border or cross country uptake fiber infrastructure projects. Some countries even deny landing rights to companies seeking to land submarine cables on their shores.

These, no doubt, are very serious policy and regulatory issues that must be addressed if we need Internet for all, especially in the not so developed parts of the world.

There is no doubt that Africa today needs optic fiber highways crisscrossing the continent.

There is also no doubt that if this happens, this will help aggregate African data traffic, reduce cost of access, increase regional transit footprints, encourage regional peering, facilitate development of local content, and enhance the contribution of Africa to the knowledge resource on the Internet.

Within national boundaries, I think it's also important that we encourage the build-out of fiber to even the remote parts of the continent, or the country. In Nigeria we have a project called the State Accelerated Broadband Initiative, and the idea is to incentivize operating companies by form some of subsidy to enable them to build fibers to those areas that they don't consider very commercially viable.

I will now talk about security. And on the issue of security of access, I wish

to approach it from a different perspective. And I will give an example of a recent happening in my country, Nigeria, where we had a major cable cut of the link to the Sat3 submarine cable infrastructure. This is the single submarine cable that actually lines on our shore in our country, though there are a number of new projects that will bring two more of that to the shores very soon.

When this cut happened it affected voice and it data traffic to and from outside the world. This was an inadvertent and unplanned cable cut.

But no doubt, disrupted critical business and social interests interactions.

And this example brings home the realization that unprotected critical infrastructure, whether state owned or privately owned, can have far-reaching consequences on the business life of a country, and could grind critical activities to a halt. And can even escalate to disaster proportions if not handled well.

So I am actually advocating, therefore, the need for governments and regulators and policymakers to plan for major protection initiatives for critical infrastructure, especially landing points and the like within their countries.

And also encourage the build-out of redundancies. And I might say diversity in the provision of critical infrastructure. And this may also include satellite communication links alternatives, even when cable transmission access are available.

Mr. Chairman, I think this is important in ensuring that when connected, we can always remain connected.

I thank you for this opportunity.

Thank you.

[Applause]

>>HOPETON DUNN: Thank you very much for those remarks. I am very sympathetic with the notion of making sure that the physical plant and the resources are protected, especially since I come from a region -- the Caribbean -- experiencing hurricanes on a regular basis, destroying much of the physical assets, and now thinking a lot about underground and other protective devices, and multimodal redundant capacity-building for our next.

Our next speaker is Mr. Ermanno Pietrosevoli. He is president of the Latin American networking school called ELaRed, based in Venezuela. Mr. Ermanno.

>>ERMANNNO PIETROSEMOLI: The slides?

>>HOPETON DUNN: Yes. Could we have the slides up?

>>ERMANNNO PIETROSEMOLI: Okay. Thank you very much. I will talk about the very specific topic that is related with all the previous presentations, and it's about how to achieve connectivity in developing countries, and how to do it with low-cost solutions.

The difference of what has been said so far is about that these will solutions that can be implemented directly by the communities that will benefit from them, and not necessarily by big corporation that sometimes do not have the incentive to serve rural and sparsely populated areas.

The motivation for this kind of work has already been dealt with by the previous speaker, so I just might add that for sparsely populated area, fiber is not the solution, because it's not cost-effective to give connectivity in a rural area by fiberoptics. Of course fiber is needed for the backbone, is needed for the international connectivity, but we need another sort of modality for serving these kind of areas.

WiMax is very promising, but is still quite expensive, and so are the cellular solutions that were mentioned before that are also very good but not the best for a rural area.

For rural areas, we have found that WiFi solution, the same kind of WiFi devices that has been employing connectivity to all of us in this venue can be easily modified to provide connectivity to rural villages and even in extended regions and even at long distances.

One of the first examples that I just reminded is University of (saying name) in Nigeria, for which we built a connection of three of the campuses back in

'95. That was a short link connection, only one kilometer, but it was a replacement of a fiberoptic cable that was much more expensive at the time.

There are many other examples of this kind of solution being implemented all over the world, and not only in developing countries but also in developed countries. There are many examples of solutions of WiFi by modifying the media access of the WiFi, we can still use the same hardware just by modification of the software, and by fitting external antennas, we can reach much longer distances.

In the quest to see how big a distance could be reached, we made an experiment in April 2006, and we were able to take advantage of a particular geography that provided a clear line of sight between a mountain that is 4,300 meters high and a hill that is 125 meters and we were able to span a distance of 280 kilometers with just normal off-the-shelf WiFi gear and external antennas.

A year later, we were able to locate another location that had a mountain of 1,500 meters at the other side, and so we could prove that it is feasible to use again WiFi gear to go over a path of 382 kilometers, even if the -- and at the speed that is quite useful for providing connectivity to a village of 8 megabits per second directional. These are just an example of -- it's not -- of course you cannot find every day this topographical suitable situation to take advantage of such a long link, and I don't think this is going to be used commercially, but it gives you an idea of how far we can go.

And in more real terms, we have done -- another example of application of WiFi technology which has been used by the people is in Malawi where we built a network to provide connectivity of the Hospital of Mangochi to the College of Medicine in Blantyre over three steps, one of 7 kilometers from Blantyre to an intermediate repeater, then 55 kilometers, and then the last test or the last stretch of 100 kilometers from Zomba Peak to Mangochi, and this was done with standard WiFi equipment and just modifying the firmware and using big external antennas. Actually these antennas weren't that big. They were just 1.2 meters in diameter. So this is an example we were able to prove the end-to-end throughput of 40 megabits per second, and I think that these will some of the solutions that can be useful for developing countries. We think that the major obstacle for this kind of solution to be more prevalent is the lack of awareness of the people of this -- of its existence, and, therefore, we have devoted most of our energy to try to spread the knowledge of this kind of solution by means of sites like WirelessU that has been sponsored by several international organizations in which there is a repository of material for low-cost wireless solutions which are available for everybody in several languages, freely downloadable, and we actually encourage people to make as much use of this as possible, and also we published a book that is called "Wireless Networking for the Developing World." This is a team effort from different people from different countries, and mentioning about multilingualism, this book has been published in six languages, including Arabic, Indonesian, English, French, Portuguese, and is again freely downloadable in the site in the site wirelessnetworkingfortheDevelopingWorld.net, or in the WirelessU site I mentioned previously.

This book can be obtained in paper for a nominal cost from the publisher because it's published under the creative common license and anybody can make use of it for training in this particular technologies.

So these are some of the organizations that have been trying to push the usefulness of this technology for developing countries. I know that the time is very short. I'd be happy to entertain any questions. Thank you very much.

[Applause]

>>HOPETON DUNN: Thank you, Ermanno, for those remarks. And that presenter would take us to the end of the number of presenters from this end of the table. This end of the room.

I wanted for us to engage in a discussion now. We have maybe just under half an hour in which we'll invite comments, questions, and all we ask is for you to

identify yourself.

There are persons in the aisles who will bring the microphones to you. Yes. I recognize.

>> Thank you. Thank you, Mr. Chairman. I would like, first, to thank the panel for very informative presentations. My name is (saying name). I'm from Kenya. I represent the private sector.

My specific question is to Pierre regarding the policies and strategies that developing countries should adopt for mobile broadband adoption.

Yesterday, I happened to be in a workshop where two presenters, one from a highly developed country and another from a developing country demonstrated two very different mobile phones. The developed country has a problem of an aging population. 30% are over 65 years. So they have developed a 4G phone that is very easily usable by the elderly, but is expensive at \$300. The developing country has a problem with a very -- with a large small population -- with a large young population. The popular phone in the developing country is a basic one that costs only \$15. The point is that in the developing world, the basic phones are apparently adequate to address the access needs of the population, so my question to Pierre is: Given the differences between developed and developing countries, do you think the developing countries need to focus on basic and affordable technology for quickly bridging the digital divide, rather than trying to keep up with the latest technology and spending resources on technology such as mobile broadband, which is too expensive for the majority of the population?

>>HOPETON DUNN: Okay. Your question has been heard. Yes, please go ahead with the response. I know we have several persons wishing to speak.

>>PIERRE DANDJINO: Thank you very much for this interesting question, and well, I think my take on it is quite simple. It's about, you know, being part of the industry.

This mobile broadband issue, there are two things that you'll notice that, okay, the needs from the developed worlds and those from developing worlds are different, actually, but the good news is that they are all, I will say, interesting to be -- sort of -- want to invest on it, and you have it shown it, the way people are investing in developing countries and also how the developing countries are prone to invest in this because it really applies to them.

Now, on the devices -- I believe this is your problem and your question -- I think, yes, if possible, one will argue that developing countries will invest on those basic, you know, outlets or equipment.

Your question actually is calling for the necessity also of thinking about, you know, local -- some local industry, and this is something we are always, you know, arguing for.

And, therefore, the policies I was alluding to also should include an element of innovation, and that's also where the investment, appropriate investment on sort of local industry is needed.

Yeah, I think that would be my take on that. Thanks.

>>HOPETON DUNN: Yes. Thank you.

>>ROHAN SAMARAJIVA: My name is Rohan Samarajiva. I represent LIRNEasia, a research organization.

What I have found a little surprising about the panel is while you are clearly and correctly focusing on the question of affordability and what governments can do to solve -- help us solve the problem, why are we not looking at the two experiences that we have had in the last 10 to 15 years? One which has been an extraordinary success and one which has been an abject failure. The extraordinary success is mobile telephony.

Because we licensed large numbers of companies in certain countries, we now have a situation where in India we are connecting 15 million people a month. We have a situation where the affordability that you are -- you and I and everybody is so concerned about is now becoming not a problem. In India, in Bangladesh, in Pakistan, a mobile phone is extraordinarily affordable. The prices, the

ARPU, the average revenues per user, are below \$5 and the companies are making profits and the companies are making investments.

So this is a successful model. What we need to do is to develop government policies that will leverage this model, that will help us to extend this model to the broadband arena. We need to ask the question: Why is it that it is possible to make profits and contribute to government revenues in south Asia at less than \$5 U.S. per customer while in poorer countries, in Africa, in Latin America in particular, we have extraordinarily high prices, same technology, same GSM being used. That suggests that there has been a failure that can be fixed because we just need to learn from the south Asian experiment and see what can be extended.

And when it comes to universal service, which is the abject failure, there is no country that I know of where this has worked very well.

We have \$4 billion unspent in Brazil. We have \$4 billion unspent in India. India made some very significant improvements in their universal policy -- service policies recently based on lots of representations, including ours, yet it cannot get rid of this money, and they ask us how to spend it. And we say, "Why are you taxing poor people?" "To keep money in funds."
"That you are not using or you are misusing."

>>HOPETON DUNN: Okay.

>>ROHAN SAMARAJIVA: So the model will be served by reducing taxes. The model will be served by freeing up frequencies, but I think we need to focus on the business model, and of government action that can support it --

>>HOPETON DUNN: Okay.

>>ROHAN SAMARAJIVA: -- rather than pure government action, which unfortunately is what I'm hearing most of the time --

>>HOPETON DUNN: Thank you.

>>ROHAN SAMARAJIVA: -- at this event. Thank you.

>>HOPETON DUNN: We're going to bank a few questions -- meaning take a few -- before we put it to the panel in order to take a few more of the questions.

I would like to acknowledge that lady at the back, and then this gentleman as well.

>>ANITA GURUMURTHY: Yeah. I would really like -- my name is Anita and I come from I.T. for Change in, an NGO in India. We do policy research as well as work in the field with marginalized populations and my reflections now just come from the experience of having worked with marginalized populations in the country, in about 50 villages in south India.

What is emerging and I think needs to also be on the debate here is that local governments -- not just federal, central governments, and state governments, but local governments -- increasingly have begun to harness the power of broadband to improve the quality of governance. So the question to be asked is, you know, where are marginalized populations standing in relation to this? And here I really feel that we need to nuance and be very clear about the roles that -- role that mobiles can play and the role that broadband can play.

It's been acknowledged the world over that public services can be a lifeline for the poor, and especially for women, and if public services and the accountability in relation to public services has to improve, then the local information transparencies, local information architecture, is changing dramatically in many countries, including in India, and here I really think that what is underemphasized but is happening very quietly in the landscape is a lot of public investment and public finance, and this really needs to be emphasized and brought back. This was on the cards and on the table in 2005 when we spoke about public finance modalities in WSIS.

I also noticed that in the context of our own work, intermediary organizations like NGOs who have been working for the right to information, right to food security, right to health, light to education, have very successfully used the broadband in order for social mobilization in order to get the entitlements to poor women, et cetera. So I think that instead of kind of looking at mobiles

versus broadband and binaries, we need to look at what kinds of architectures in terms of technical as well as policy architectures, we're going to be able to promote local governments to be more accountable, more transparent and more relevant to local populations. Thank you.

>>HOPETON DUNN: Thank you very much. We just take this remaining question and then we put the questions we've had to the panel.

>>MOHAMED EL-MOGHAZI: Good afternoon, everyone. I'm Mohamed El-Moghazi from the interior of Egypt. Just I have a question for the last speaker, Mr. Ermanno.

Regarding the WiFi solutions that were proposed, how do you see the regulation for such links, considerable the fact that most countries are not allowing such big power -- huge amount of power to be used in those unlicensed bands.

And my second question: How reliable are those links? Thank you.

>>HOPETON DUNN: Okay. And we've been followed, of course, on the Internet by a large audience, and we have one or two questions coming through from them.

The first one --

>>AMR BADAWI: One point of order. Translation will stop at 1:00 p.m., so -- but we can continue the meeting beyond that, but people who cannot understand English I think will have to bear with us somehow. Thank you.

>>HOPETON DUNN: Okay. So we'll bear that in mind and speed things up a bit. We have a question from someone online: Are there practical measures to protect fiberoptic cables? Are there practical measures to protect fiberoptic cables?

So we have a number of questions which we would like members of the panel to address. First of all, the one from Rohan Samarajiva to do with mobile telephony and the universal service as varying levels of successes, and the question we've just heard from India as well as the question relating to WiFi.

Could we start with anyone wishing to respond in respect of mobiles and universal service?

>>ERNEST NDUKWE: Thank you very much. I think, Rohan, you are quite right about the success of mobile communications. There's no doubt that that has been a major driver of connectivity and reach. For the mass market. That's why during my early intervention, I said that for many developing countries today, mass market links to the Internet has to be wireless, and mobile technology plays a very important role in that regard.

But I'm also aware that we don't have a one size fits all Argentina because even in some parts of the world, even mobile signals have not reached some places, and sometimes you might depend on other technologies to be able to reach those rather remote locations.

And also, one other issue with mobile is that technologies, especially with respect to the terminal equipment, sometimes can also be a challenge. Especially when you want to access the Internet.

The phones that are able to do things like broadband and Internet sometimes are a bit on the high side as far as the ordinary person is concerned, but definitely I think you're very correct that we should, as much as possible, take advantage of the wide spread of mobile technologies at fairly affordable rates in order to spread broadband to as many parts of the world's population as possible. Thank you.

>>HOPETON DUNN: Any responses to the question? Yes.

>>PIERRE DANDJINO: Thank you very much. I think the -- good question posed by the lady from I think India on local government and their role.

Yes, definitely, I think that can also be addressed on what I was alluding to, which is the national policy towards this spreading, you know, this mobile broadband issue.

I definitely think that we need to be much more innovative, especially at this policymaking, and you are so right that we should incorporate, you know, all stakeholders. Namely, the local governments.

So I will say, yes, it's about, you know, being innovative, and if we are

really serious about extending the benefit or the opportunities to the marginalized or kind of rural areas.

So I'll say, yeah, it can be addressed by the policy, the national policies I would put in place.

>>HOPETON DUNN: Okay. The question about WiFi?

>>ERMANNIO PIETROSEMOLI: Well, the question was very specific, and I should have answered that in my presentation, but I was in a hurry because they limited the time.

Anyway, as regards power, we are not exceeding the power limit. These experiments were done with just 100 milliwatts of output power and just by fitting an external antenna, we were able to reach longer distances, so power is not an issue.

And as far as the license bands, we are using the unlicensed 12.4 gigahertz band, which is available just about anywhere. Some countries are more liberal in the use of that band than others, but it is in one way or other available anywhere.

Furthermore, the same technology can also be used in different bands, and as some of the panelists have suggested, the allocation of special frequency bands for rural applications will be a very smart move from government and regulators, and if done nowadays in which there are frequency agile radios that can be quickly put to use in different bands, this opens the road for very low-cost solutions to be applied with this kind of technologies.

>>HOPETON DUNN: Great. Thank you. So we take just maybe two or three more questions. We'll ask Jose Clastornik from -- to make his question.

>>JOSE CLASTORNIK: Hi. My name is Jose Clastornik. I am the Executive Director of the national Information Society agency in Uruguay.

I wanted to speak about a relevant project on the matter. It's the first one-laptop-per-child model implementation known to be done at a national scale.

>>HOPETON DUNN: I'm not sure we're hearing you clearly.

>>JOSE CLASTORNIK: Okay. Now yes?

>>HOPETON DUNN: That's better, yes.

>>JOSE CLASTORNIK: It's a project, the first one-laptop-per-child model implementation known to be done at a national scale.

The second project, although you can think about it as an occasional project, we in the first years use it as a -- as an access project in order to integrate more people to the Internet. The principles that guided the project are the right to access (inaudible) for all the people, equal opportunities, and the democratization of knowledge.

Our intention was to give one laptop per child and for each teacher, to give connectivity to all schools and high schools, and to make possible for all the children that they had connectivity just 2- to 300 meters from their home, and we achieved this in no more than 2 1/2 years using all methods of connectivity you can think about.

From cable to satellite, WiFi, mesh technologies, and so on.

And although it was a government project, I must emphasize the work done by the social -- the civil society, for example, in helping children -- helping teachers and in helping the families of the children in introducing the technology in their families.

If I -- I can summarize this, I can say that in a little more than two years, one-fourth of the homes of the country have now one or more laptops in their homes, and they have also connectivity.

They have free access to Internet in all cities or villages where you can find a school or high school.

At the middle of the project, Cisco and IDC make --

>>HOPETON DUNN: Jose, can I ask you to conclude and summarize and maybe pose a question?

>>JOSE CLASTORNIK: Yeah. I think the success of the project you can measure it in the volume of connectivity. We doubled in each year the connectivity, the

broadband connectivity of the country that already was one of the greatest in Latin America. And it -- this access you can measure in a lot of ways. We have elections now. This is the most successful project of the government, and if you want to have a little more information, you can find on the Web.

>>HOPETON DUNN: Yes. Thank you. Thank you. I'm sure that those people wishing further information about that whole LPC project can contact Jose in the in-between time.

Colleagues, we are looking to wrap up now. We have one more question which we will take from the person at the very back, and then we will ask our session chair to conclude in a minute or two. Please go ahead. No? Oh, sorry. It's a gentleman.

>>FOTINDONG CORNELIUS: Okay. Thank you very much, Mr. Chairman.

I am Fotindong Cornelius from Cameroon. I work with the Minister of Posts and Telecommunications, where we are in charge of defining policy with regards to access.

We realize that with the liberalization of the telecommunications sector there has been a tremendous advantageous increase in the mobile connectivity, increase in tele-density, in mobile tele-density on Internet connectivity. These are some of the efforts of the privatization. But there are two major challenges that still need to be addressed.

For example, access in the rural and enclaved areas, the mobile operators, the commission operators are reluctant to invest in these areas because of the little profits or no profits that are there.

Secondly, you have the problem of developing a national backbone.

The commission operators do not agree on developing a single backbone. They intend to -- each one -- each wants to develop a backbone, so there will end up being parallel backbones. Of course this has an incidence on the end user through the charges, the tariffs that they will be charged.

In view of this situation, government is tempted to review the liberalization policy that is trying to take over the connection of the rural areas which have not been covered by the coverage -- or not covered by the commission operators, and the development of the national backbone.

Within that -- we also think that the deployment of certain technologies like the landing price of some marine cables are issues of national sovereignty and should be handled by the government.

I would like Mr. Badawi of Egypt and Mr. Ndukwe of Nigeria, because they are directly concerned, also Mr. Mohamed El Nawawy, to tell us how these things are -- how these issues are addressed in their own countries. Thank you.

>>HOPETON DUNN: Okay. Great. Thank you very much. We have heard that question.

We are just going to ask the selected members of the panel who may wish to make very short responses to questions which are remaining, to be very concise in just a couple of responses before we move to the conclusion of the session.

Any responses?

>>ERNEST NDUKWE: I'd like to comment on the last question.

One thing I'll really recommend is that you don't reverse the liberalization process that we are already undertaking. I think it's good.

What we have done in our country with respect to extending backbone infrastructure to rural areas is adopting what we call State Accelerated Broadband Infrastructure. And what you can do is to incentivize your operators by some form of subsidy in order to extend this cable infrastructure to rural areas.

Just bear in mind that many of the incumbent operators operated for over 50 years without getting to those rural areas. So government may not be the right provider of such infrastructure, to my mind.

So I think you still need to see a way of working with the private operators by some form of subsidy that will ensure that you achieve the goal of extending services to all parts of the country.

Thank you very much.

>>HOPETON DUNN: Okay. I think that brings us to the end of the responses, both from the panel and the questions from the audience, given time.

We did have a number of queries and questions coming through online. We have not been able to respond to but one of them. And we know we have other questions pending in the audience that we have also not been able to get to.

But so far, we have been able to get to quite a few. And I want to thank you for your participation, and also invite you to thank members of the panel for their presentation before we get to the wrap up.

Thank you.

[Applause]

>>HOPETON DUNN: Mr. Badawi.

>>AMR BADAWI: We heard some very interesting presentations today. I think they were very technical, but I think they were to the point. And I can say that from these presentations, we can come to some conclusions. Where the main issue is to provide affordable access. Affordable access can be provided through better management of spectrum. And I think with the digital divide, we have a historic opportunity to be able to provide broadband, wireless broadband at reduced cost provided that the governments start managing that spectrum.

And especially for governments in countries like in the African countries, the Arab countries, where they have stark differences from what exist in Europe in terms of the broadcasting services available and the utilization of TV channels.

If you look at especially the 700 megahertz band, you will find that in most Arab and African countries the utilization is extremely low, and that is really wasted band that could be very, very well used in providing broadband services. And I urge the countries there to get together and see what would be the best means to advance on that issue.

The other thing is that we need to reduce cost. Especially for rural areas, we should look at universal service funds that are available, and that could reduce the cost of accessing the network.

We have heard about the marine cables. Marine cables will provide much cheaper international bandwidth to all developing countries. And that saving has to pass through to the customers. If the operators and the Internet service providers pass that to the consumer, definitely, and we urge them to do that, then we will have a more affordable broadband.

The infrastructure itself, the fiberoptic infrastructure within the country, I know there are different levels of infrastructures available, but this is a national -- it should a national project to make sure that all the country is well connected. And I think the governments should provide incentives even for just purely infrastructure companies to provide these services to the different operators, whether mobile, fixed, and Internet service provider.

We have what we have heard from Venezuela regarding their experimentation with less expensive technologies is something to be encouraged for developing countries. And maximum use of available inexpensive technology should be there.

I think that kind of wraps up all the issues. And we can -- I would recommend that this would be part of the declarations or statements listed by this conference.

>>HOPETON DUNN: Okay. Thank you, Mr. Badawi. And thank you to those who have remained. Thank you very much.

We wish now to conclude this session.

Thank you very much.

[Applause]