**Essential Technologies – ICT**

**Slide 1 –**

\*The topic of today’s lecture is Energy as an Essential Technology.

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\*A short video footage will be introduced here later.

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\*What is Information & Communication Technology exactly?

In very simple terms, ICT refers to any device or system that allows the storage, retrieval, manipulation, transmission and receipt of information signals. Common examples include computers, television, telephone, radio and several others, as the list keeps growing.

ICT devices are today indispensable in our daily lives. And the concepts, methods and applications involved in ICT are constantly evolving on an almost daily basis.

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\*In 2016, 3.9 billion people, or about 53% of the world’s population is not using the Internet.

If we break it down by regions, we see that almost 75% of people in Africa are offline, while only 21% of Europeans are offline.

In the Middle East and Asia and the Pacific and the Arab States, the percentage of the population that is not using the Internet is about 58%.

The gender gap in global Internet usage grew from 11% in 2013 to 12% in 2016. The gap remains large in the world’s Least Developed Countries (LDCs) - at 31%.

In 2016, the regional gender gap is largest in Africa at 23%, and smallest in the Americas at 2%.

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\*In general, globally we see that the average price of a basic fixed-broadband plan is more than twice as high as the average price of a comparable mobile broadband plan.

But, paradoxically, mobile broadband prices are about 2.5 times higher in least-developed-countries than developed countries.

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\*In developed countries, over 75% of fixed-broadband subscriptions offer speeds of 10 Mbit/s and above in the developed countries.

In the LDCs, only 7% of fixed-broadband subscriptions offer speeds of 10 Mbit/s or above.

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\*We saw the paradox in the previous slide where the poorest countries still paying outrageously higher prices for broadband services. Why is that? There are many factors at play, of course.

But one of them is that most African countries installed their first internet Gateway through satellite links.

This made Africa rely on satellites and Very Small Aperture Terminal (VSAT) earth stations for most of its connectivity, which resulted in high prices and slow performance as compared to other technologies.

However, there are several multi-country projects initiated to lay down undersea fibre optic cables around Africa, linking it with the Middle East, Europe and beyond. The use of fibre optic technology is expected to significantly boost bandwith capacity of the African closest to the cables

A **submarine communications cable** is a cable laid on the [sea bed](https://en.wikipedia.org/wiki/Seabed) between land-based stations to carry [telecommunication](https://en.wikipedia.org/wiki/Telecommunication) signals across stretches of ocean. Modern cables use [optical fiber](https://en.wikipedia.org/wiki/Optical_fiber) technology to carry [digital data](https://en.wikipedia.org/wiki/Digital_data), which includes telephone, [Internet](https://en.wikipedia.org/wiki/Internet) and private data traffic.

With respect to potential impact on surrounding environment, previous studies have indicated that cables pose minimal impacts on life in these environments. When sediment cores around cables and in areas removed from cables were sampled, there was minor statistically significant difference in organism diversity or abundance.

As you can see on the map on the screen, the diagram is very and we will not take time to describe it in detail, but I invite you to examine in more detail after the lecture and the related references.

But briefly, some of the first submarine cable project include Seacom (on the East Coast), EASSy, which stands for Eastern Africa Submarine Cable System and WACS (for West Africa Cable System).

Huawei Marine earlier this week announced it has completed upgrades on the West Africa Cable System (WACS), the largest submarine cable directly linking Africa to Europe, using a 100G transmission solution that will enhance network connectivity and operational efficiency.

In a similar vein, Huawei Marine has commenced marine installation of the Nigeria-Cameroon Submarine Cable System (NCSCS), Cameroon's first wholly owned submarine cable, with investment provided by the Cameroon Government. The cable, which spans approximately 1,100 km, will link Cameroon directly with Nigeria delivering 12.8 Tbps of capacity to broadband users in both countries by the end of 2015.

According to the head of Cameroon Telecommunications Corporation, David Emane, the direct connection to Nigeria will enhance Cameroon's position as the major bandwidth hub in the region and internationally, to Europe and beyond.

Recently, South African entities Telkom and MTN, along with Saudi Telecom Company (STC) and Telecom Egypt (TE) signed a memorandum of understanding in April this year to build another sub-marine cable system Africa-1.

The Africa-1 submarine cable system is planned to stretch 12 000 km from South Africa to Saudi Arabia, Egypt and Pakistan and provide more broadband capacity to Africa. The PCCW statement further said the cable could go live in late 2017.

But according Chris Wood, the co-chair of the EASSy consortium, in his view Africa currently has enough broadband capacity, as all of the existing submarine cable systems, i.e. EASSy, Seacom and WACS all have spare capacity and can be easily upgraded for higher capacity.

Interestingly, some of the partners and investors in the Africa-1 are also investors in the some of the previous submarine cables.

When asked to comment about their potential involvement in the Africa-1 project, a senior executive of the MTN Group in South Africa said that: “The Africa-1 initiative provides another opportunity to ensure long-term capacity supply, beyond the design capacity limit of some of our current investments,”

But overall, this still begs the question as to why Africa is still lagging so far behind in this area, despite all this available bandwith infrastructure.

And perhaps the arrival of more players will help dynamize and finally drive down the prices to international levels, one might really hope.

More references have been provided at the end for further reading.

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\*In the sessions on Essential Technologies for Health and Energy, we saw already the power of mobile telephony towards some of the challenges in those sectors in developing countries.

Perhaps the area where many believe that mobile communications technology will have a truly transformative impact is Digital Finance.

According to a new report from the McKinsey Global Institute, digital finance could be a powerful tool for driving inclusive growth in emerging economies.

The report states that widespread adoption and use of digital finance could increase the GDPs of all emerging economies by 6 percent, or a total of $3.7 trillion, by 2025.

Digital finance could provide access to 1.6 billion unbanked people, of which more than half would be women.

An additional $2.1 trillion of loans to individuals and small businesses could be made sustainably, as providers gain newfound ability to assess credit risk for a wider pool of borrowers. Governments could gain $110 billion per year by reducing leakage in public spending and tax collection.

Providers of [financial services](http://www.mckinsey.com/industries/financial-services/our-insights) would benefit, too. They stand to save $400 billion annually in direct costs by shifting from traditional to digital accounts, which can be 80 to 90 percent less expensive to service.

By expanding their customer base, providers would increase revenue opportunities and could sustainably increase their balance sheets by as much as $4.2 trillion.

I highly encourage you to consult this in more detail from the link provided in the references at the end of the lecture.

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\*One of pioneers and most successful digital finance platforms to date is **M-Pesa**. Where **M** stands for mobile, and ***pesa*** is [Swahili](https://en.wikipedia.org/wiki/Swahili_language) for money.

M-Pesa is a mobile phone-based money transfer, financing and [microfinancing](https://en.wikipedia.org/wiki/Microfinance) service, launched in 2007 by some of the largest mobile network operators in [Kenya](https://en.wikipedia.org/wiki/Kenya) and [Tanzania](https://en.wikipedia.org/wiki/Tanzania).

It has since expanded to Afghanistan, South Africa, India, Romania and Albania.

M-Pesa allows users to deposit, withdraw, transfer money and pay for goods and services with ease using a mobile device.

The service allows users to deposit money into an account stored on their cell phones, to send balances using [PIN](https://en.wikipedia.org/wiki/Personal_identification_number)-secured [SMS text messages](https://en.wikipedia.org/wiki/Short_Message_Service) to other users, including sellers of goods and services, and to redeem deposits for regular money.

Users are charged a small fee for sending and withdrawing money using the service.

The service has been lauded for giving millions of people access to the formal financial system and for reducing crime in an otherwise largely cash-based society.