ITU POLICY AND ECONOMICS COLLOQUIUM FOR AMERICAS / COLOQUIO UIT DE POLÍTICAS Y ECONOMÍA PARA AMÉRICA (IPEC-23)

BUSINESS PLANNING FOR INFRASTRUCTURE DEVELOPMENT USING 5G/

PLANEACIÓN DE NEGOCIOS PARA EL DESARROLLO DE INFRAESTRUCTURA USANDO 5G

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Licensing for mobile broadband services: the coverage obligations and their impact on reducing the digital divide

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Content of the presentation

1. Universal Service: a Hindsigth

1. International Standardization (The ITU-R Sector)

2. Wireless Emerging Systems

Content of the presentation

1. Obligation to do: alternative option to USF projects
2. Coverage: Broadcasting; Roads Areas: Unattended population
3. To do in Internet: more than coverage, traffic, new users

Telecom Universal Access: Inception

"the telephone system should be universal, interdependent and intercommunicating, affording opportunity for any subscriber to any exchange to communicate with any other subscriber of any other exchange within the limits of speaking distance"

In what year was this quotation ?

Universal Service to all Public Services/Utilities:

- Water Supply
- Electricity
- **Broadcasting**
- **Telephony**
- **Challenge: Infrastructure Deployment (CAPEX)**
- **NOT requiring users skills**

Universal Access: State PPT Era

Telephony: State Monopoly

PTTs guarantee the Universal Service: **AAA**

- **A**ccessibility: Provide the Service
- **A**ffordability: at affordable prices (at least similar to urban users)
- **A**vailability: same quality

Mechanism:

→ Over fee to wealthy/urban users (contribution)

→ Subsidize to (basic amount, minutes)

Urban low income users (affordability)

Rural users (accessibility and affordability

Over-fee on the LD rates

Solidarity Economy : PTT are “collectors” NOT the Funders

It was a common practice to reflect this mechanism on the users bills

Universal Access Universal Service:

In Developing Countries the Universal Service was a out of reach goal
Option:
Urban: Universal Service
"*a Telephone line at every household*"

Rural : Universal Access
"*everyone, at home or at work, should be within a* ***reasonable distance*** *of a telephone (public)"*
- Reasonably distance: 1 to 10 km depending among others on: topography, roads, vehicles

1980's: The Maitland Report, Diagnostic

1982: ITU PP (Nairobi, Kenya) Independent Commission* for World-Wide Telecommunications Development Chaired by Donald Maitland, to:

- identify the obstacles hindering communications infrastructure development
- recommend ways in which the expansion of telecommunications across the world could be stimulated.

1984: ***The Missing Link (***also known as the ***Maitland Report***)

- correlation between access to telecommunication infrastructure and a country's economic growth
- huge imbalance in telephone access between developed and developing countries
  - 600 millions lines: 75% in 9 countries (world: 4.6 billions: 13% Teledensity)
  - 75% world population <10% Telephone density)
- this imbalance was intolerable.

* Armando VARGAS ARAYA (Costa Rica) (Vice-Chairman; Manuel PEREZ GUERRERO (Venezuela)

Maitland Report : Recommendations

1. Governments and development agencies should give a higher priority to investment in telecommunications.
2. Networks in developing countries should be made commercially viable.
3. Financing arrangements should take into account the scarcity of foreign exchange in developing countries.
4. The ITU should play a more catalytic role

Strategies:

- One World One Network (common standards, interoperability)
- Private Sector Involvement
- Market competition
- Price in line with cost (reasonable profit)
- Scare Resources Allocation (numbering, spectrum)
- Government & Multilateral Investment

1990's : Liberalization, Privatization

Ending the State Monopoly
Enter on new players: private companies/foreign PPTs

The PTT Universal Service model → Obsolete

Creation of Telecom Regulatory Authorities, NRAs (market watchdog)
Universal Service Funds, USF:

- All Players will feed the USF; % of revenues
- NRAs will implement Universal Service Projects, funded with USF resources
- Who implement them? : Same Operators
- Before: PTT collect funds, and implement projects
- Now: Operators feed the USF, NRA design projects, and bidding; Operators implement them (levered by the USF)
- **Solidairty Econmy remains!** (% to USF on business case)

2000's : MNOs, Internet

The mobile networks growth was vertiginous

Telephone density (fixed+mobile) From ~13% in 80s to 80% in 2005

Universal Service: from Households to Personal

Prepaid model allowed a massive and affordable service (>70% mobile subscribers)

Spectrum become a major asset on the Public Telecommunications
License to MNOs → Spectrum Assigment

Service: from telephony to Broadband Access to Internet
IMT2000 (3G)

Connectivity: New Paradigms

Connectivity: broadband connection to Internet

Service: to individuals

Access: to Public LAN (Telecenters, Cyber-cafes)

Digital Society: Connecting

- Schools: e-learning
- Hospitals: e-Health
- Municipalities: e-government
- Public Areas: Libraries, Parcs, etc.

Connectivity: New Paradigms

Internet is NOT an Utility
Universal Access is NOT only connectivity (Infrastructure)
Also needed:

- ICT Literacy
- Content and Applications of relevance for communities

INFRASTRUCTURE
ICT NRAs : connectivity projects
Operators: deploy and manage networks

Who manage the other key elements?

- Involve other stakeholders (Education, Health, Finance, etc.)
- Regulatory frameworks for e-economy/e-society

200's USF Projects: Challenges

In most of developing countries (and also in developed ones) the USF funds implementation shown to be very low

- REGULATEL Report on USF:
- world and LA benchmarking → the utmost of USF implemented less than 20% of collected resources
- Clashing with National Treasuries
- Lack of Technical/Skilled Staff to Design the Projects
- Asymmetry of Information to model business case and necessary leverage

Rapid evolution of Connectivity Speeds → short term projects 5 to 10 years, not enough to reach the auto sustainability

Only connectivity (absence of key players of digital inclusion)

At the end of project, most of telecentres/connected entities get disconnected; new projects same beneficed communities

Least developed countries? USFs with very small resources

200's USF Projects: Challenges

Developed Countries:
Digital divide very low (>20%), and mostly rural
Rural population with high incomes
USF with big cash

- Low % of subsidized population
- Low subsidize per capita, post paid (high ARPU)
- Can lever both CAPEX and OPEX: long term sustainability

Developing Countries:
Digital divide very large (>50%), and both urban and rural population with low incomes
USF with modest cash

- High % of subsidized population
- High subsidize per capita, prepaid(low ARPU)
- Lever only CAPEX and initial OPEX: hard to get sustainability

Digital Divide: Affordability is the new key

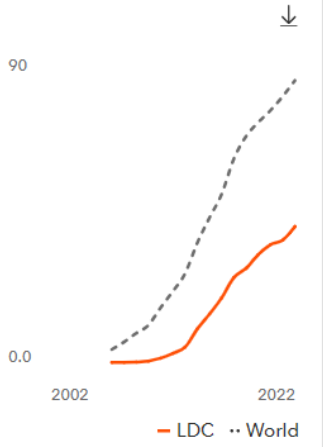
Fixed and mobile subscriptions × Least Developed Countries (LDC) × Select a comparison →

Connectivity
Access

Active mobile-broadband subscriptions

41.9

per 100 people
2022

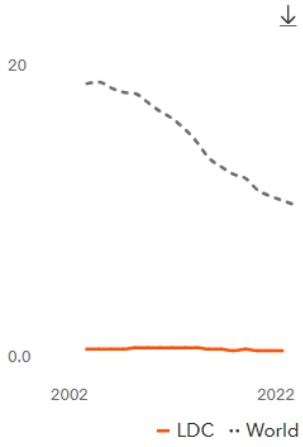


Connectivity
Access

Fixed-telephone subscriptions

0.80

per 100 people
2021

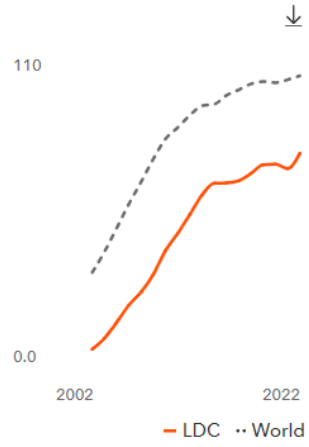


Connectivity
Access

Mobile-cellular subscriptions

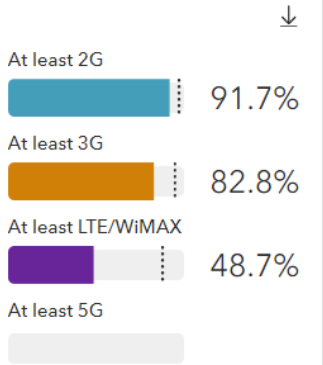
78.7

per 100 people
2022



Connectivity
Access

Population coverage, by mobile network technology



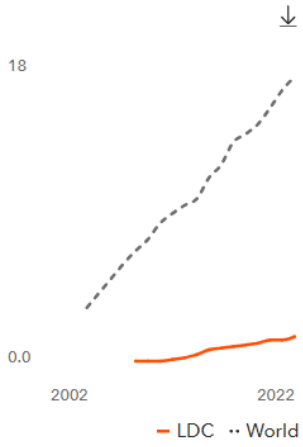
%
2022

Connectivity
Access

Fixed-broadband subscriptions

1.6

per 100 people
2022



Digital Divide: Affordability is the new key

UN Broadband Commission

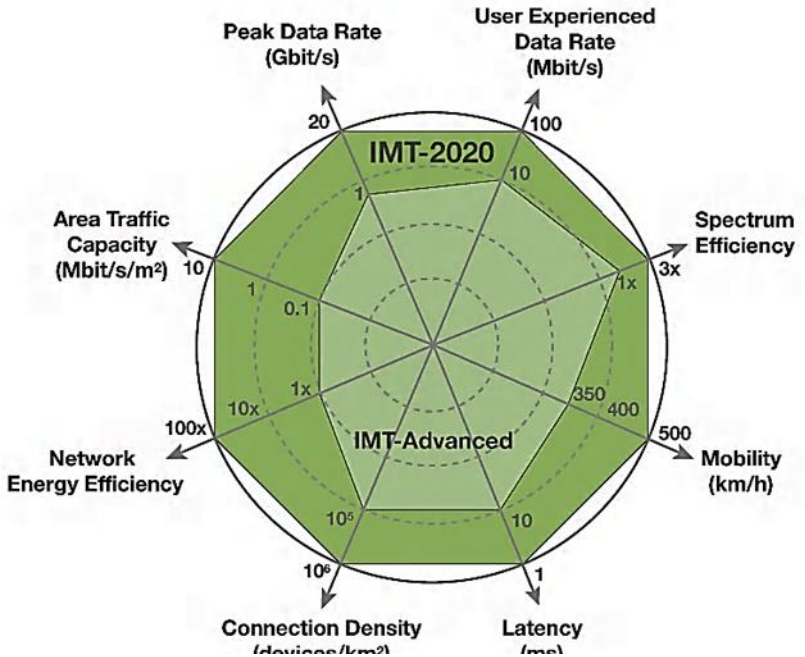
By 2025, entry-level broadband services should be made affordable in low- and middle-income countries (LMICs) at ***less than 2 per cent of monthly Gross National Income (GNI) per capita***

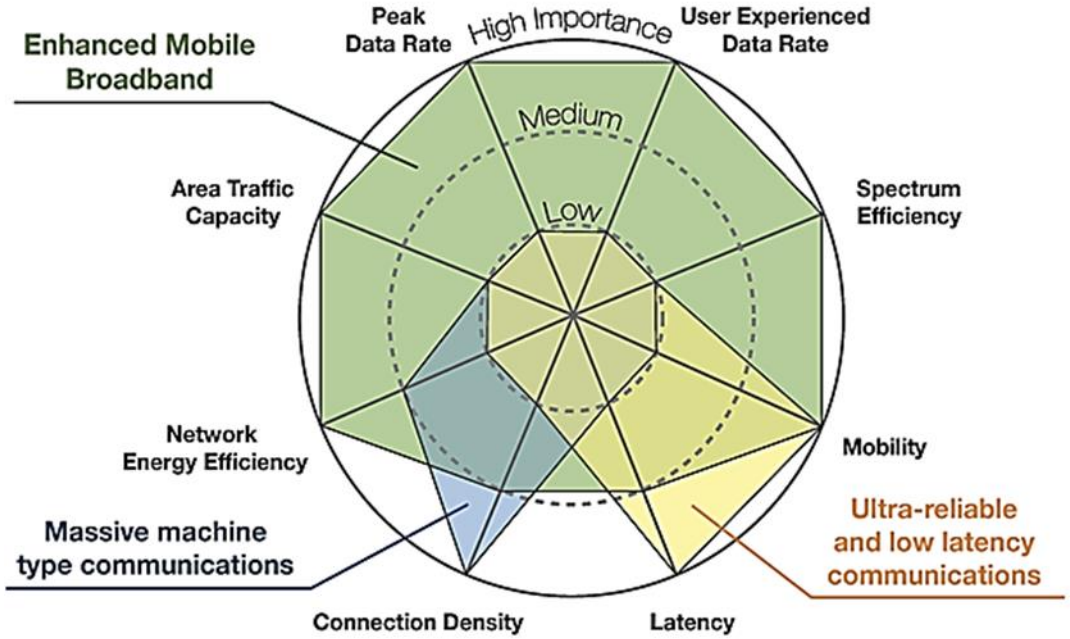
Developing countries
UP o 80% Prepaid

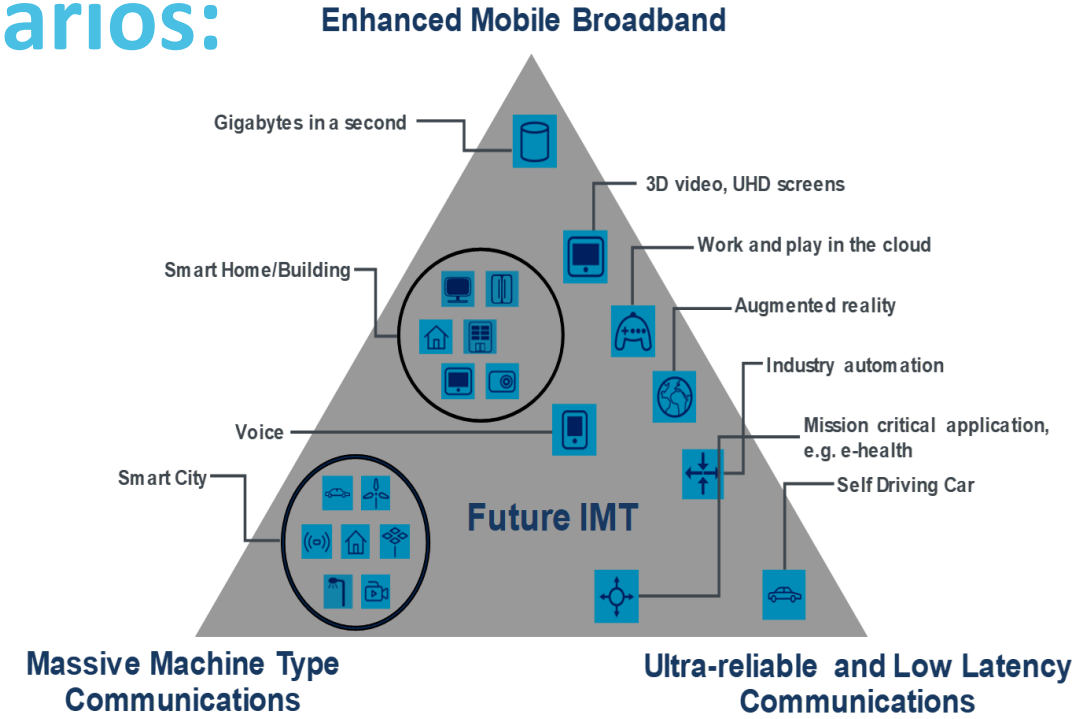
GNIPC ~2400 USD/year
200/month
2% → 4 USD/month

ICT price baskets		Minimum monthly allowance: Voice (min)	SMS (#)	Data
1	Data-only mobile-broadband basket	-	-	2 GB
2	Mobile data and voice low-consumption basket	70	20	500 MB
3	Mobile data and voice high-consumption basket	140	70	2 GB
4	Mobile-cellular low-usage basket	70	20	-
5	Fixed-broadband basket	-	-	5 GB

5G Scenarios:







5G in Developing Countries:

- The MMTC and ULLC Scenarios are still incipient
- Business Case will be focused on eMMB

eMBB performance improvements will push down connectivity prices
Enough to BBC prices?
Terminal cost?
It tackles the connectivity issue; other challenges remains

Obligations To do

Alternative to NRA/USF Projects

Instead of attending the communities with USF Projects (implemented by Operators)
Since the licensing Operators are required to attend those communities

Theoretically: Faster, simpler, more efficient

New challenges,

Only tackle the infrastructure issue

Obligations to do

Coverage obligation is relevant (and enough) for:

- Broadcasting Service
- Extend mobile network coverage to specific areas, as
- - Roads
- - Natural Parcs
- Benefit current users

- To bridging the digital divide, coverage is the 1st step, but not the unique one

- Obligation related to users?, e,g
- - Traffic
- - New users within the new covered area

Obligations to do: Challenges

Challenges:

- Operator shall make what was strictly demanded not more
- Counter-Incentives: when no traffic is more profitable (e.g. : backhaul via satellite)

It shall be defined **ex-ante**
KPIs: Speeds: maximum, user experience, availability, others
KPIs measuring methodology (realistic)

Obligations vs Motivation: legal frameworks for penalties and beyond

Spectrum Issues:
Frequencies: Whitin license? Other bands? Other technologies? Outsourcing?
Duration: obligation time < license time? Upgrades? (20 years: 6G, 7G…)
Obligations transfers in a spectrum secondary market /license sharing

Payments: upfront, annual, several instalments vs obligations roadmap

Obligations to do

Obligation to fixed points (Public entities),

Using the same Bands? : be careful of NFAT! (MOBILE vs FIXED)
In addition to connectivity:
LAN : laptops. Servers, software, etc. : only to deliver? Also to manage it?
MNO also an IT provider?

Obligation to do tackle de connectivity issue

The ICT Literacy?
Content/Applications adapted to the community?
Role of other players? (education health, etc)

Obligations to do

Connectivity is 1st step but not only one

Virtuoso circle achieve if:

- Communities achieve the digital inclusion e-economy/e-society
- After the obligation period, they can afford the connectivity fee (benefit> costs)
- Government achieve NBNP Goals
- Operators expand their market

Long Term sustainability (and actual impact) requires a multifaceted strategy

THANKS ☺
GRACIAS ☺

Further info:

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