

Internet Infrastructure in Pakistan

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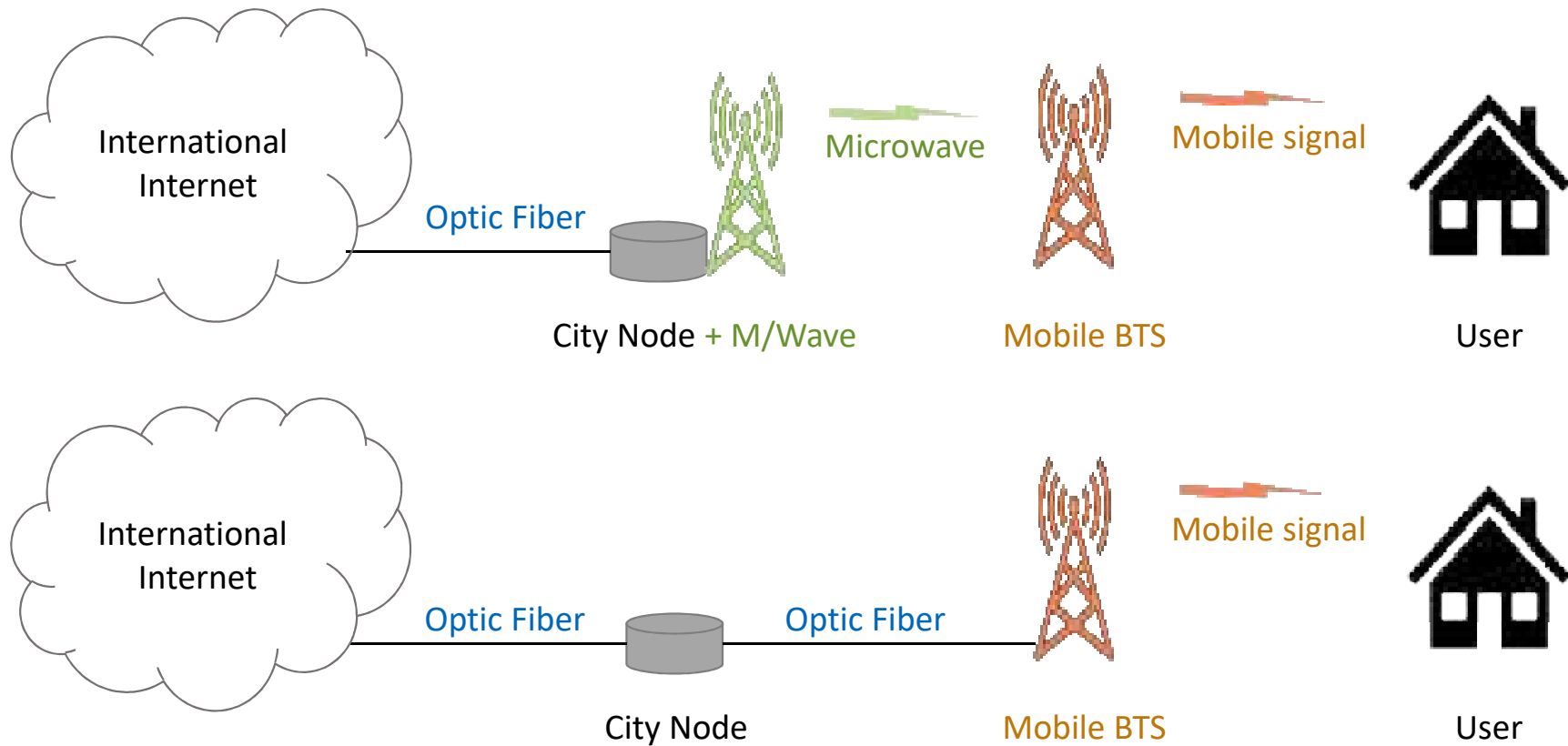
Agenda

1. Basics of Internet Infrastructure
 - a) Wired - Optic Fiber Cables
 - b) Wireless - Mobile
 - c) User Devices
2. Pakistan Internet Infrastructure
3. Internet Infrastructure Challenges in Pakistan

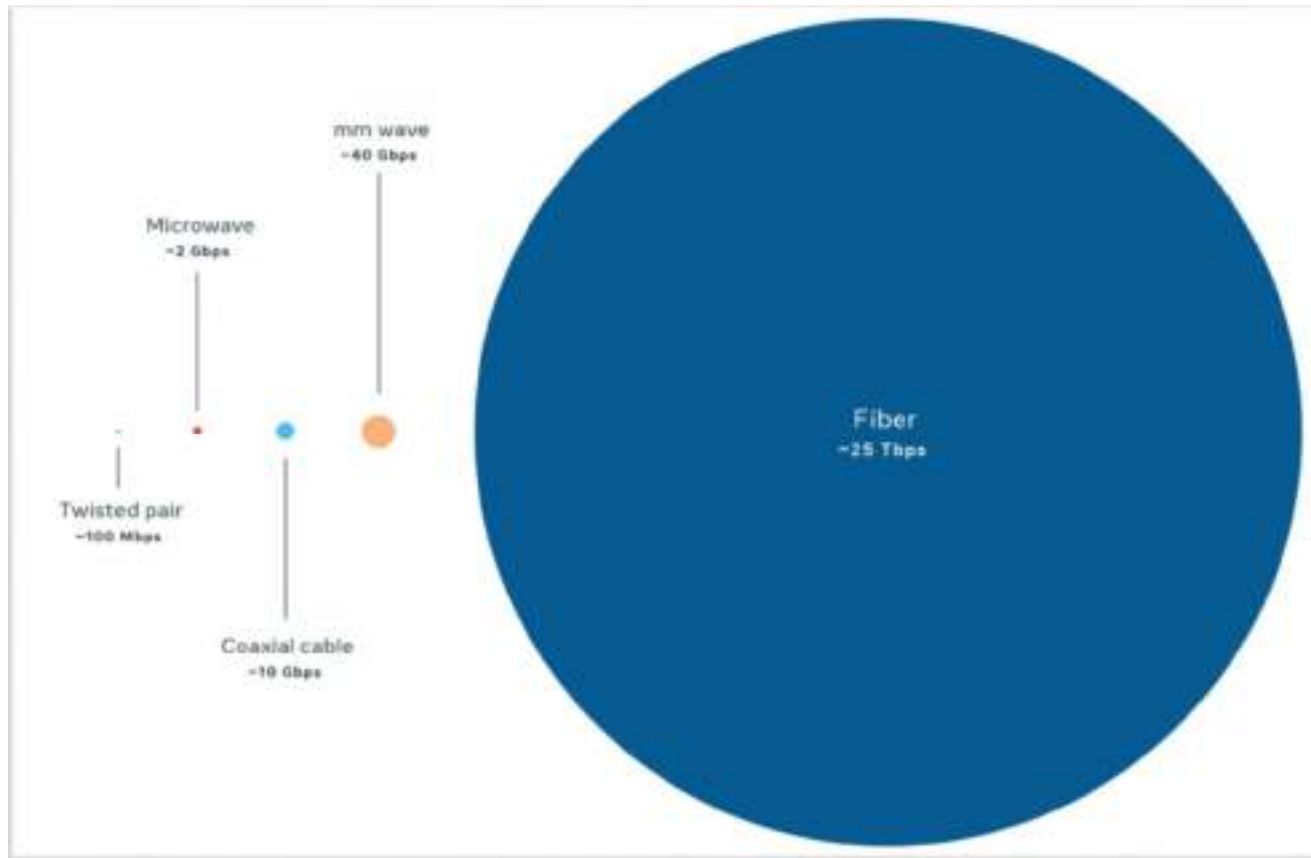
Basics of Internet Infrastructure



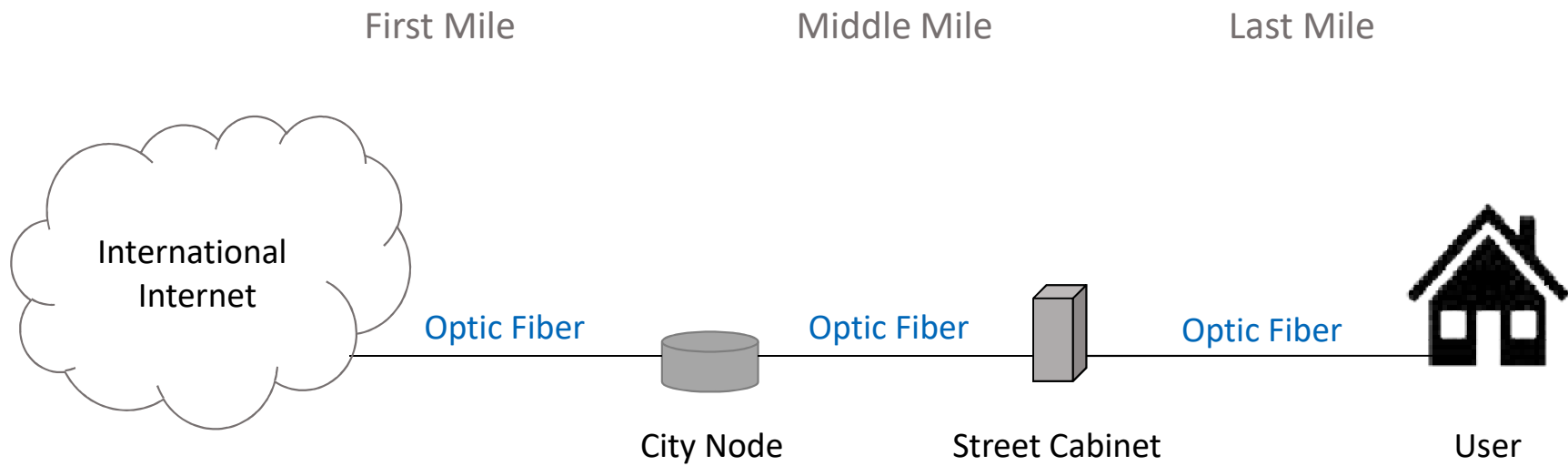
How WIRELESS Internet connects the Users



Data carrying capacity of Optic Fiber vs others



How Fully WIRED Internet (FTTH) connects the Users



Optic Fiber Cables are Backbone of Internet

Optic Fiber Cables (OFCs) connect:

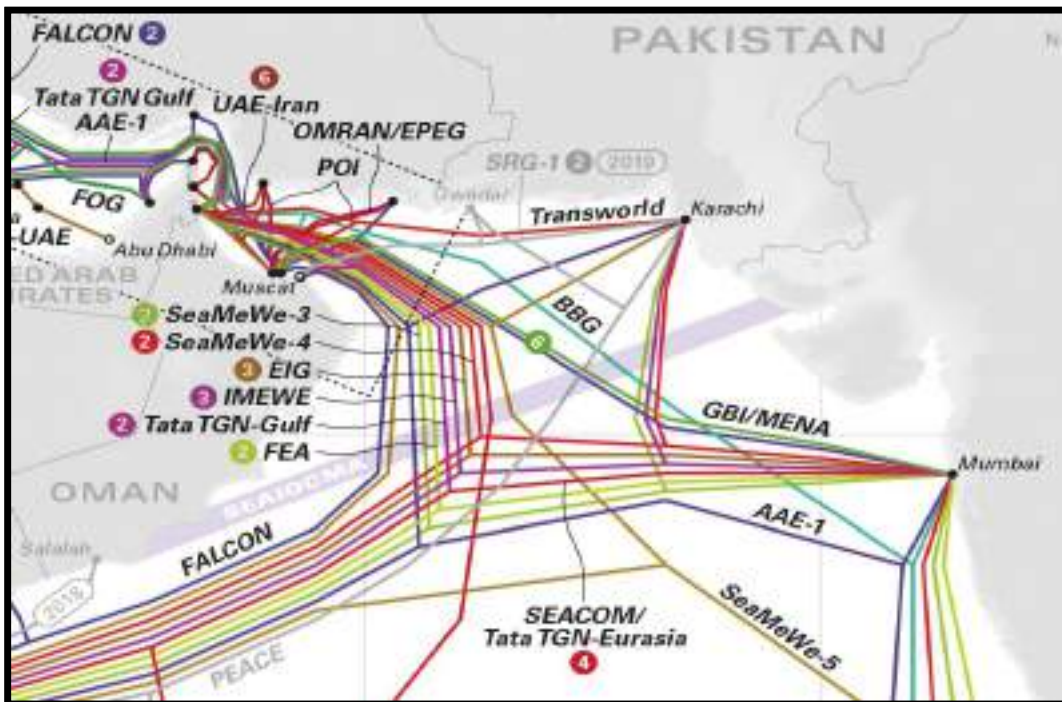
- **Countries** with OFCs laid under the seas
- **Cities** within the country
- Various parts **within** the cities
- Mobile Towers, Businesses, Households, Schools, Hospitals, etc.

Coming to Pakistan



Pakistan International Connectivity

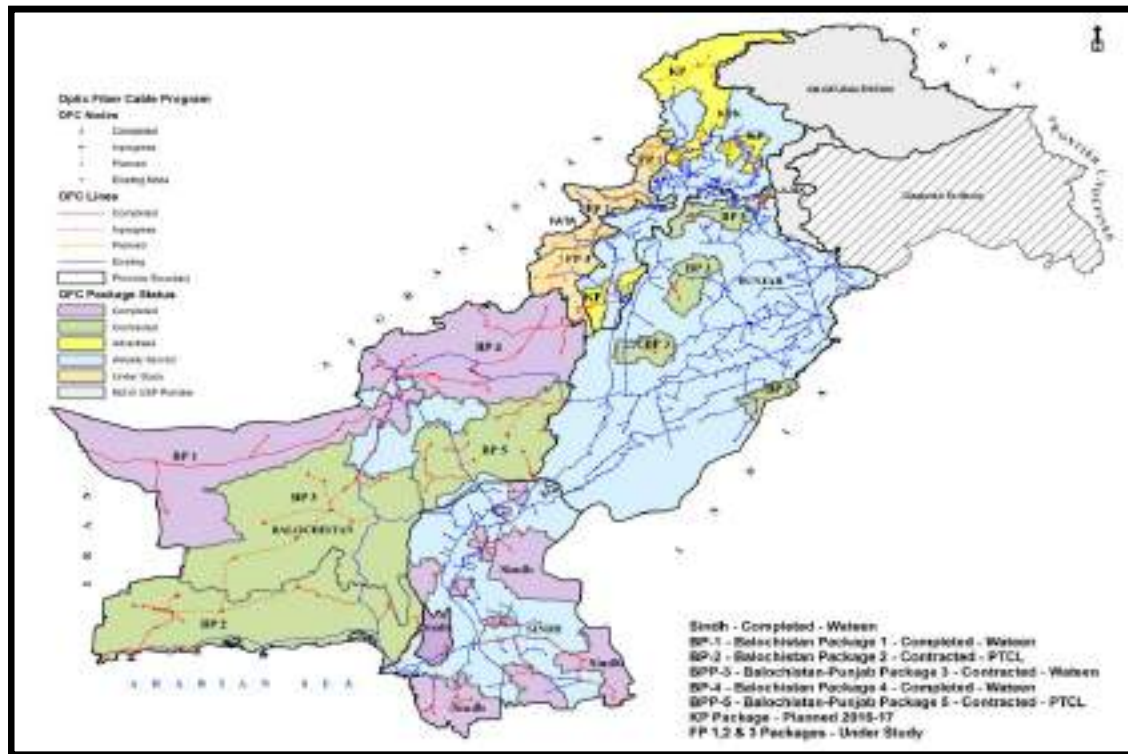
6 current undersea cables + 1 under construction



	Undersea Cable	Local Operator	Capacity (Tbps)	
1	SEA-ME-WE-3	PTCL	0.48	
2	SEA-ME-WE-4	PTCL	1.28	
3	IMEWE	PTCL	3.86	
4	AAE-1	PTCL	40	
5	TWA-1	Transworld	1.28	
6	SEA-ME-WE-5	Transworld	24	
7	PEACE (Pakistan East Africa Connecting Europe)	Cybernet	90	Under constr.
8				

Source: TeleGeography

Pakistan Domestic Fiber Connectivity



OFCs connect all cities in Pakistan - up to all 400+ Tehsil HQr and beyond.

In Pakistan Last-Mile predominantly Wireless



* Figures are updated as on October 2021

Source: PTA Website

Entire Internet Infrastructure is Privately Owned



EXCEPTIONS:



For Govt's own use.

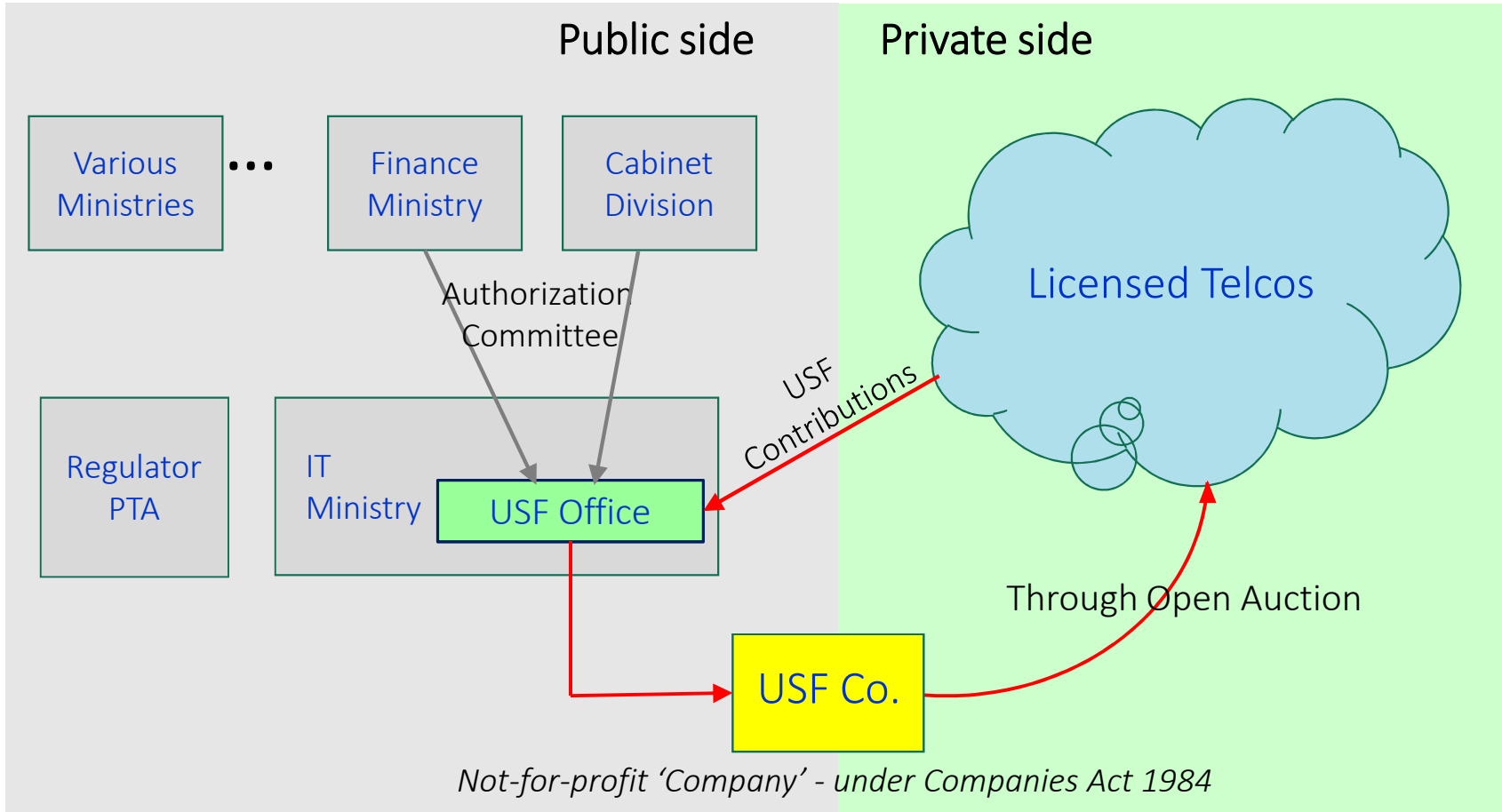


For NA's and AJK

Private Sector invests only if its profitable!

- In Remote and Rural Areas
 - Investment required is higher than in urban areas
 - Expenses to operate are also higher
 - But Returns are lower
- Thus many remote and rural areas remain unserved
- Therefore Govts create a separate Fund, in which Telcos are made to pay
- In Pakistan it is called “Universal Service Fund” (USF)
 - USF collects funds from the operators – 1.5% of Revenue
 - With the money collected, USF subsidizes provision of services in those areas
 - By giving funds to the operators, decided through open bidding.

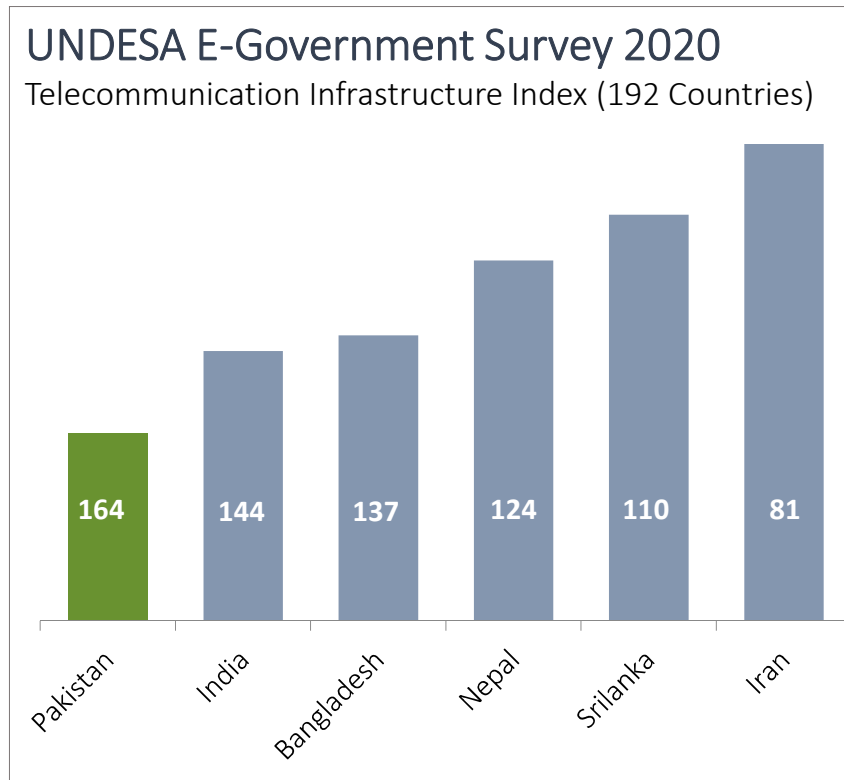
Universal Service Fund in Pakistan



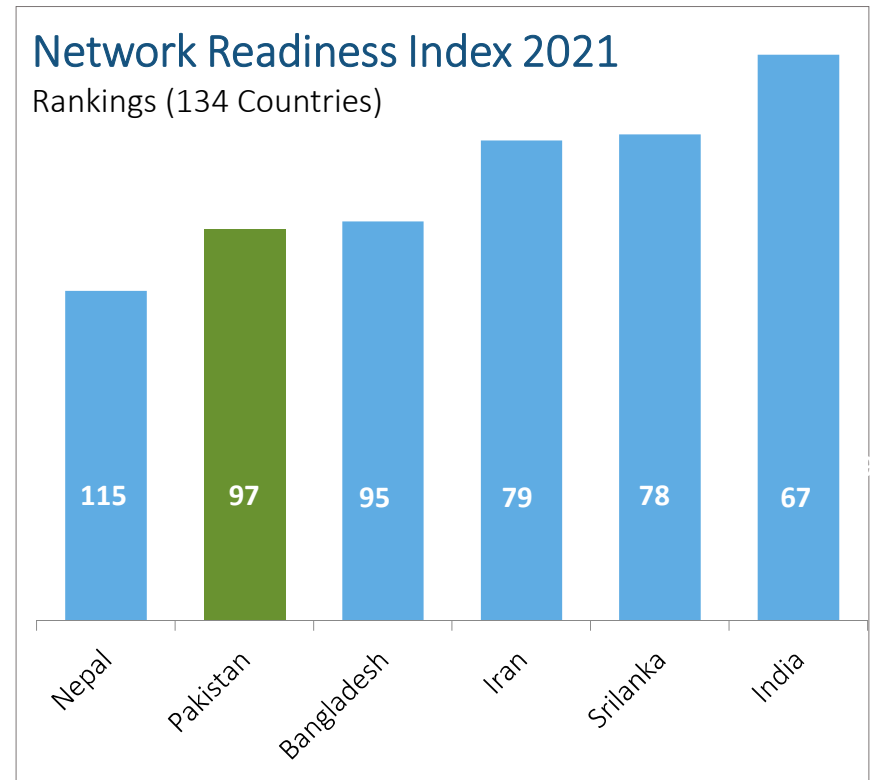
Internet Infrastructure Challenges



Overall Pakistan Infrastructure lags behind



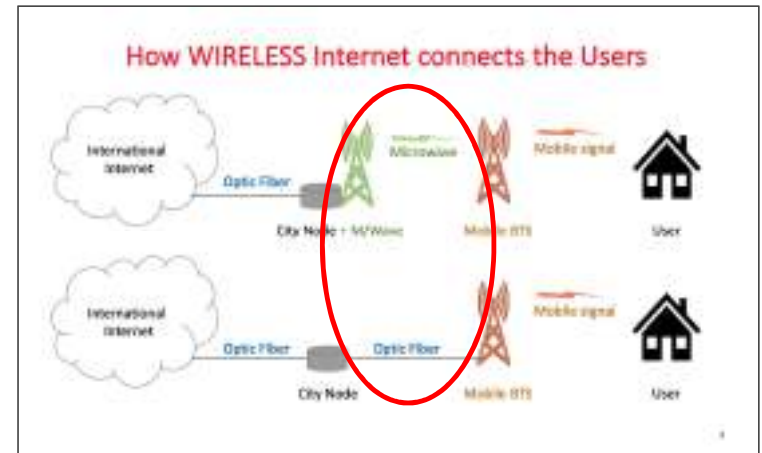
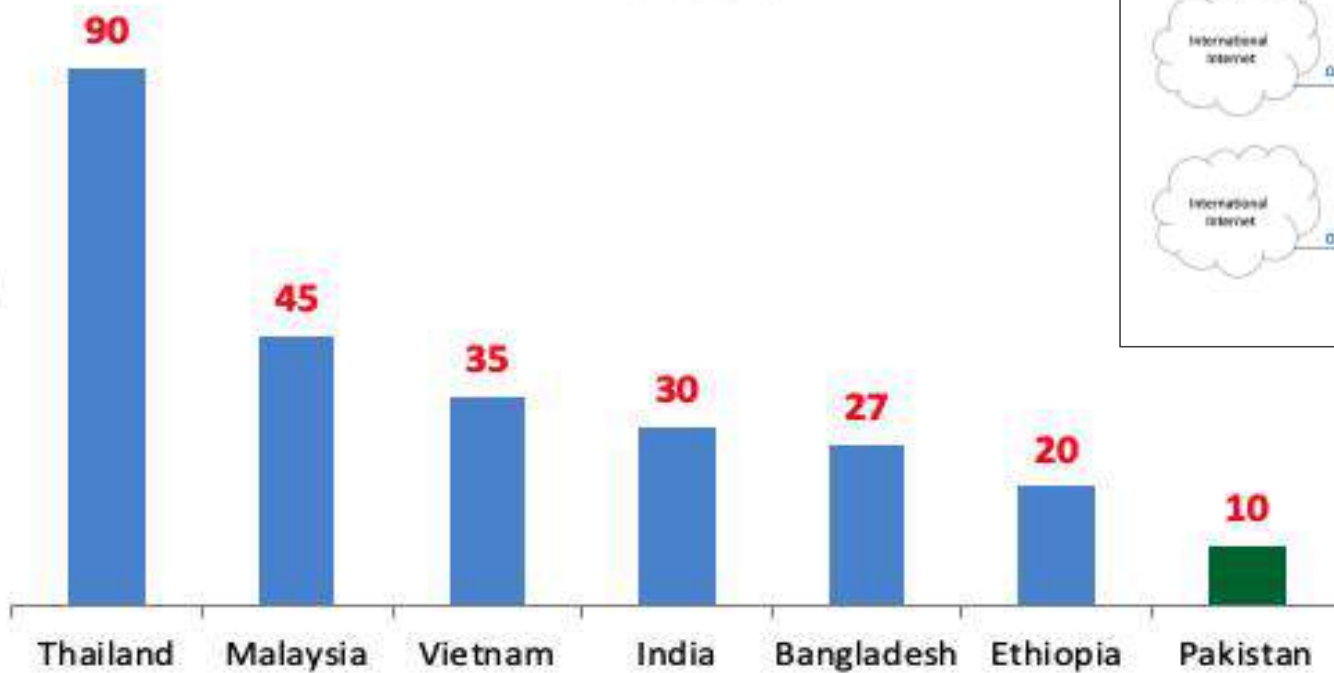
Source:
[https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20\(Full%20Report\).pdf](https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf)



Source:
https://networkreadinessindex.org/wp-content/uploads/2020/11/NRI-2020-V8_28-11-2020.pdf

Optic Fiber Penetration is Low

Percent Mobile Towers connected with Fibers

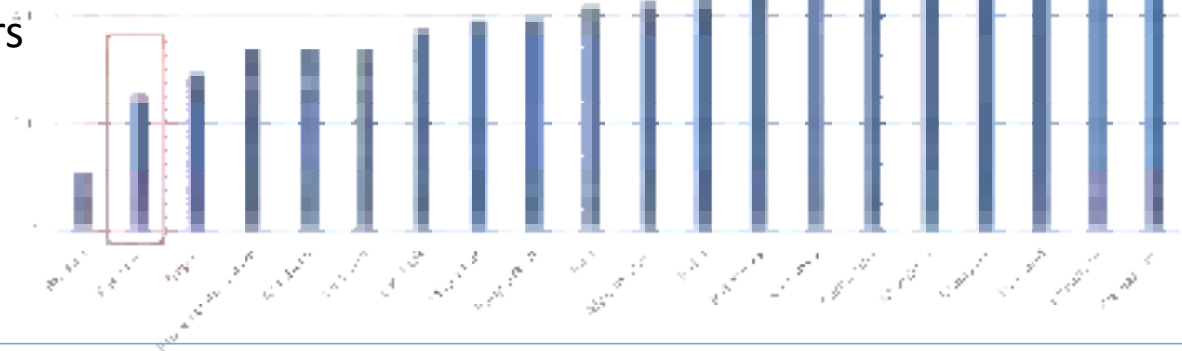


Challenges of deploying Optic Fibers in Pakistan

- High Investment & Slow Returns – even in urban areas
- ROW (Right of Way) / Permissions
 - Cumbersome Procedures, Expensive, Duplications
- Perceived Lack of Demand
 - Schools, Govt. offices, Healthcare facilities, Citizen Facilitation Centers
- High Taxation on ICTs
 - Pakistan - one of highest in the World + ICT highest taxed in Pakistan
- Others
 - No strong 'Telecom Infrastructure Provider' Licensees

Allocated Spectrum to Mobile Operators is Low

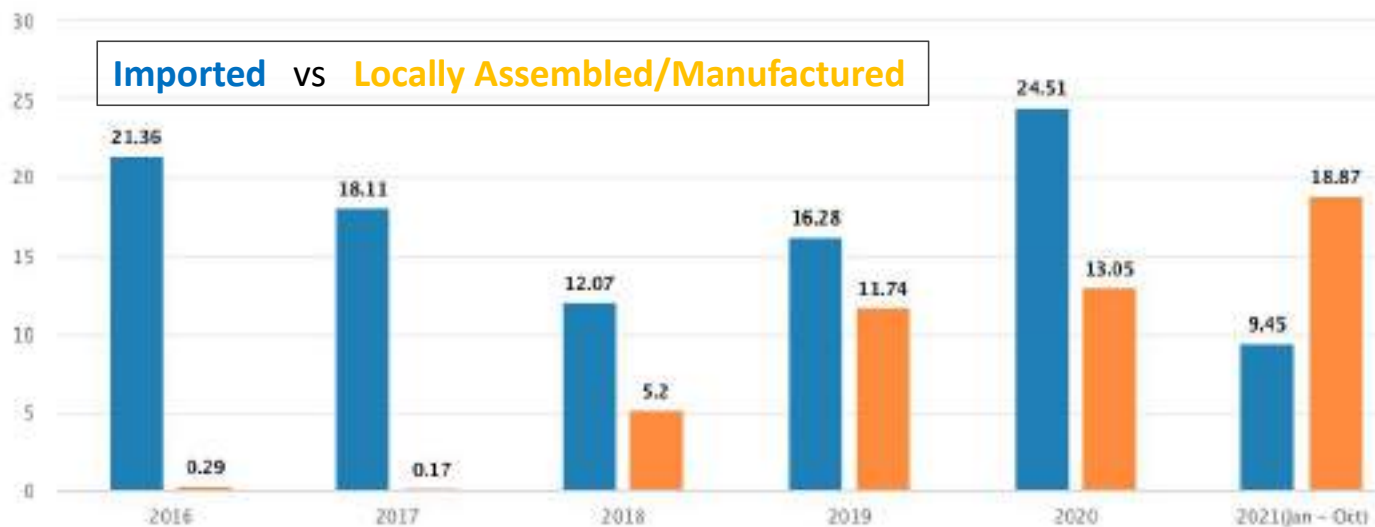
- Wireless/Mobile runs on “Spectrum”
- Spectrum is also like Right-of-Way, but in the air
- Govt. has allocated very little Spectrum
- Spectrum base prices in Auctions are high
- Towers also need permissions to instal, and face same problems as Optic Fibers



Slight increase in Pakistan's allocated Spectrum very recently. However, overall picture unchanged.

Access Devices Penetration is also Low

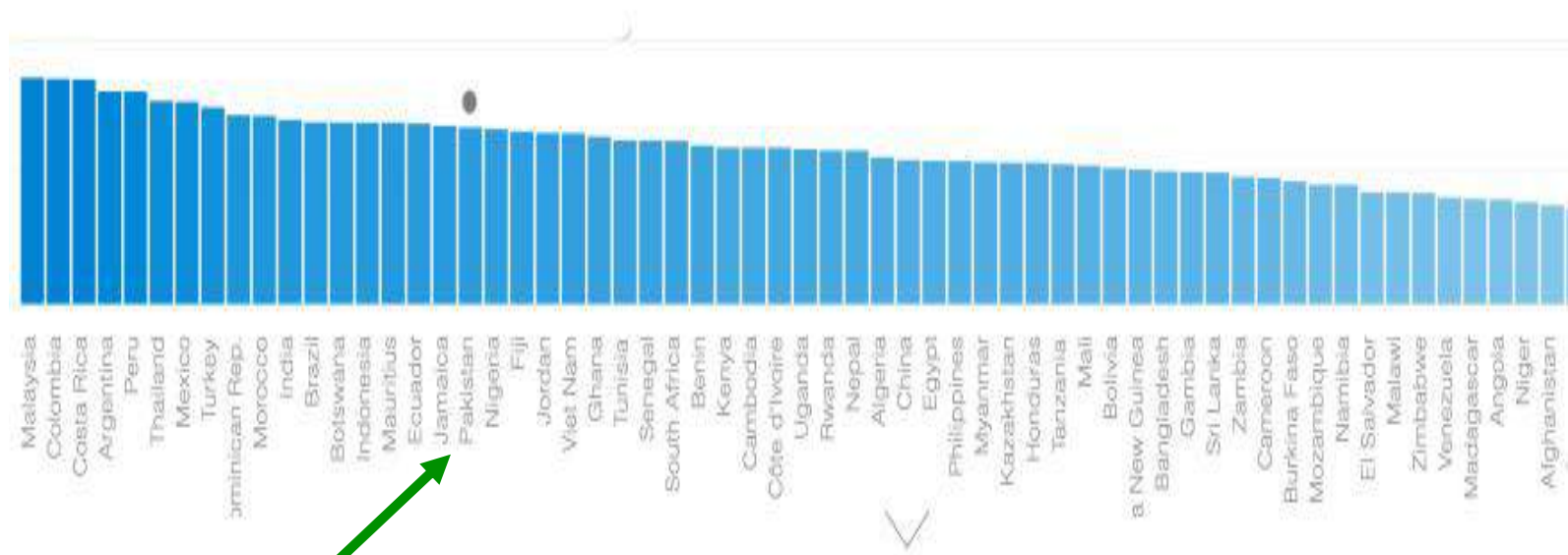
- Smartphone is the **most used** Internet access device
- Many Pakistanis cannot afford a Smartphone
- Recently Local Assembly of Mobile Devices started by over 25 companies



Other related issues



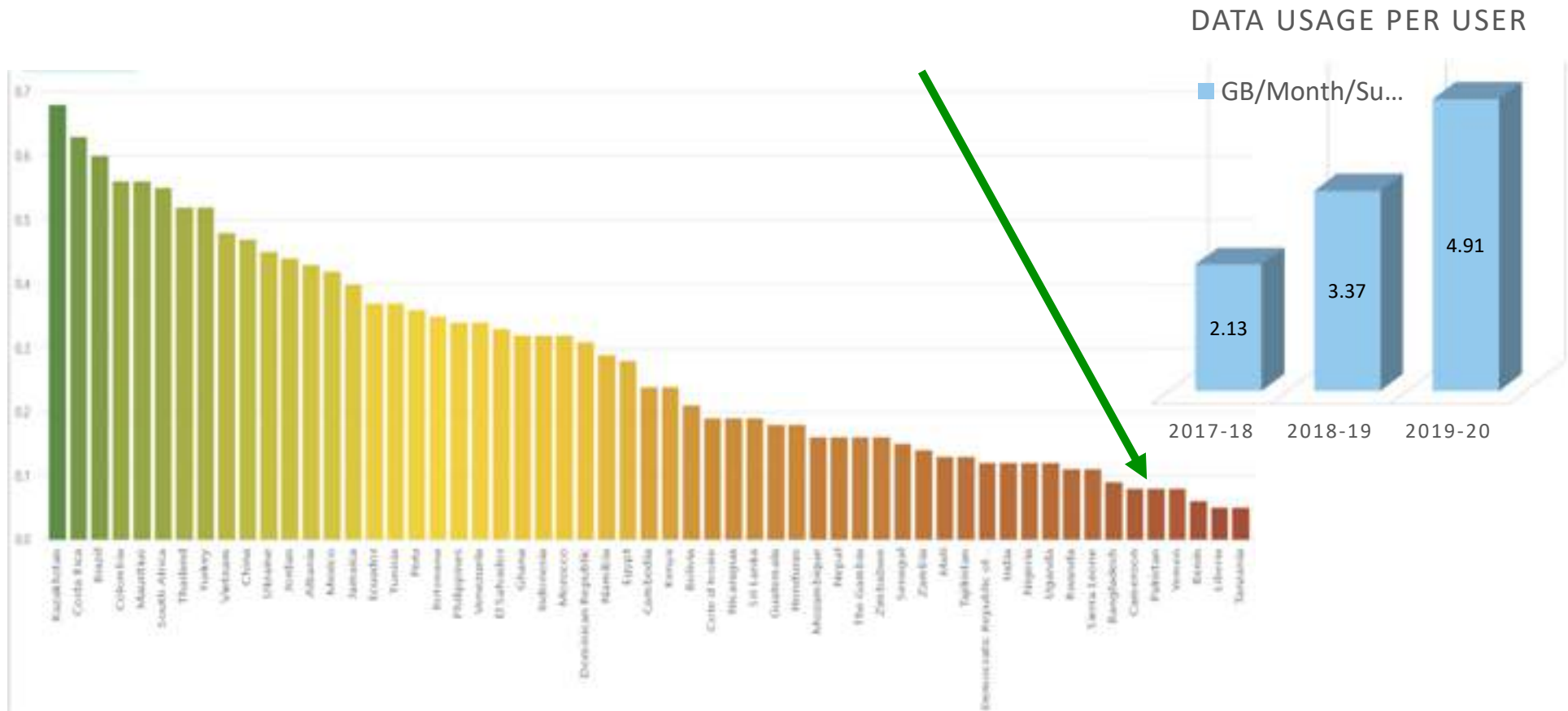
Internet *Service* is quite affordable in Pakistan



Pakistan is 18th most affordable internet service country in the world.

Source: A4AI Affordability Report 2020

Internet Usage in Pakistan is Low



Internet is not Inclusive enough

For:

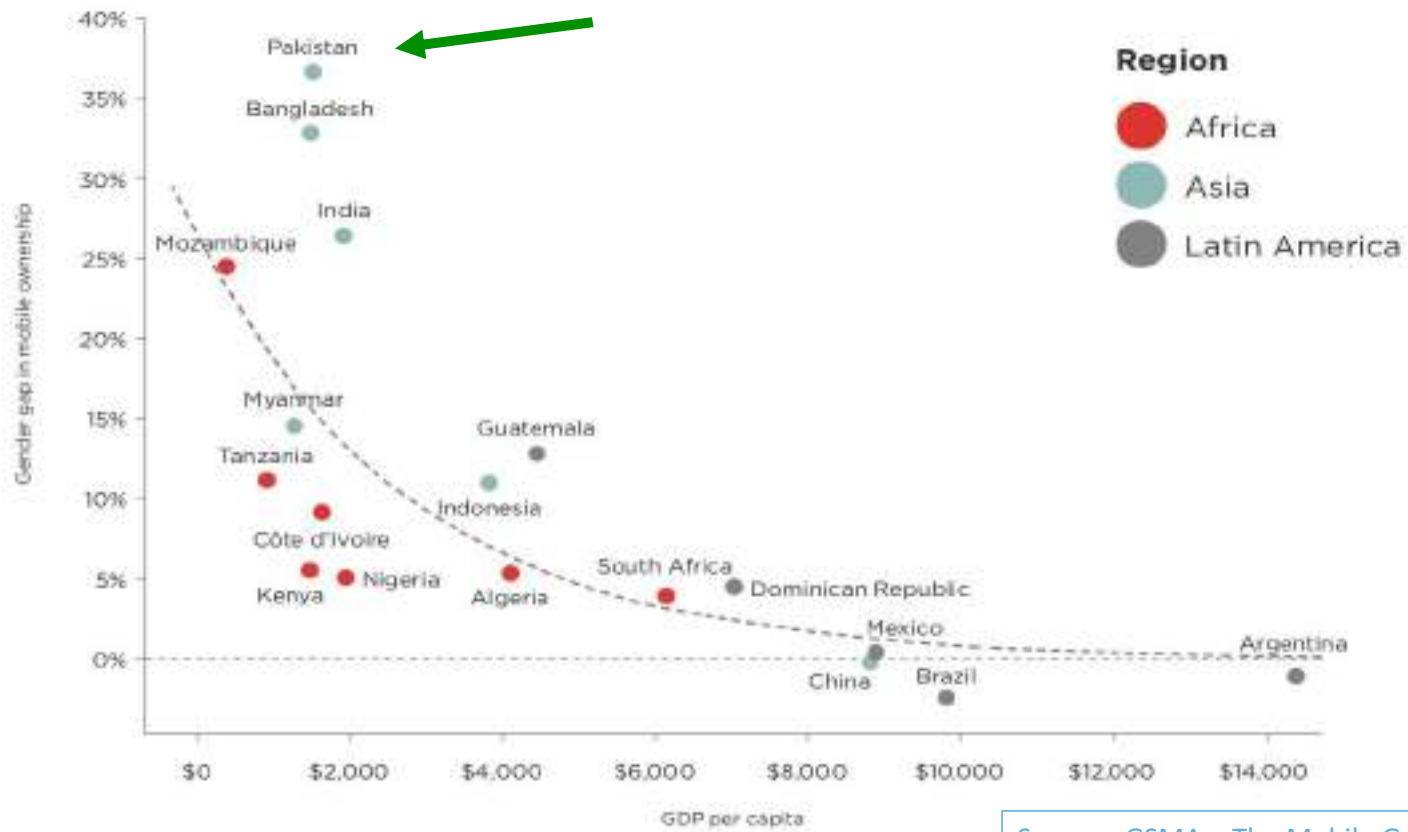
- Persons with Disabilities
- The Poor & Marginalized

And

- Women/Girls – 50% population



Internet Gender Gap



Source: GSMA - The Mobile Gender gap Report 2019

Digital Literacy / Skills Challenge

Questions?



