Internet Network Management and Policy Recommendations

Asia-Pacific Telecommunity (APT)

UNESCAP Sub-Regional Workshop on Internet Traffic Management for the Asia-Pacific Information Superhighway, 7-8 December 2016, Thimphu, Bhutan

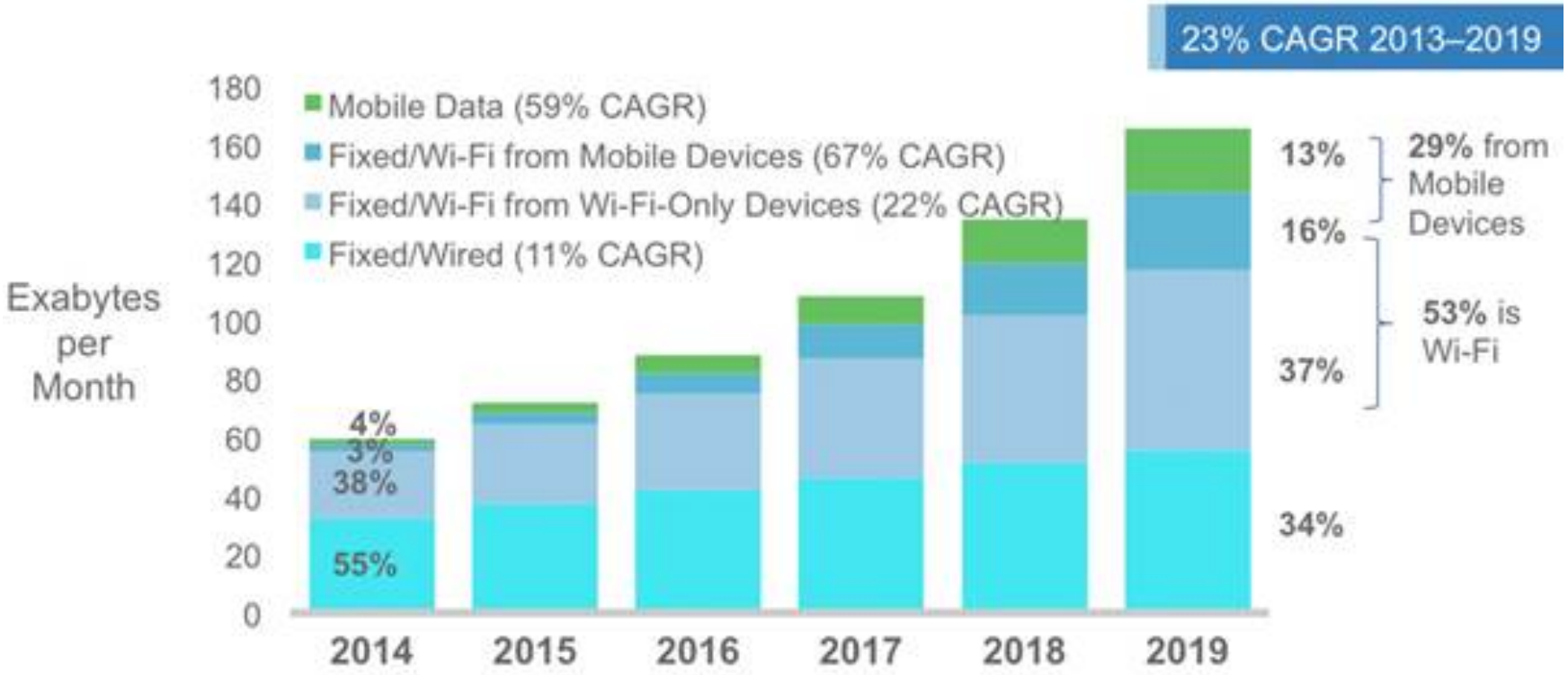
Brief about Asia-Pacific Telecommunity (APT)

- An inter-governmental organization established by UNESCAP and ITU in 1979
- Headquarter based in Bangkok, Thailand
- Membership scope is open for ESCAP Region. Currently having
  - 38 Members (Countries)
  - 4 Associate Members
  - 131 Affiliate Members
- Activities of APT included various aspects of Telecommunication/ICT such as:
  - Policy and regulations
  - Radiocommunication/Spectrum Management
  - Capacity Building and Development
  - Standardization
  - Regional coordination for major ITU Conferences

The SDG and ICT4SDG

- 2030 Agenda for Sustainable Development
- Sustainable Development Goals: 17 Goals and 169 Targets
- ICT will be crucial for achieving SDGs.
- ICT the key enabler for three pillars of sustainable development:
  - Economic Development
  - Social Inclusion
  - Environment Protection
- ICT4SDG

The Internet and Data Demand



IP Traffic by Access Technology (Source: Cisco VNI Mobile, 2016)

What is going to happen in IP traffic demand by 2030?

- Difficult to predict at this stage
- Due to new technology evolution in telecommunication networks, particularly availability of 5G, SDN and IoT will drive the IP traffic demand to many folds
- May increase 100 times or 1000 times or even more!!!
- How to cope with the increasing demand and achieve SDGs?

The answer:

- A sustainable ICT infrastructure for Internet
  - Resilient and affordable broadband Internet for all

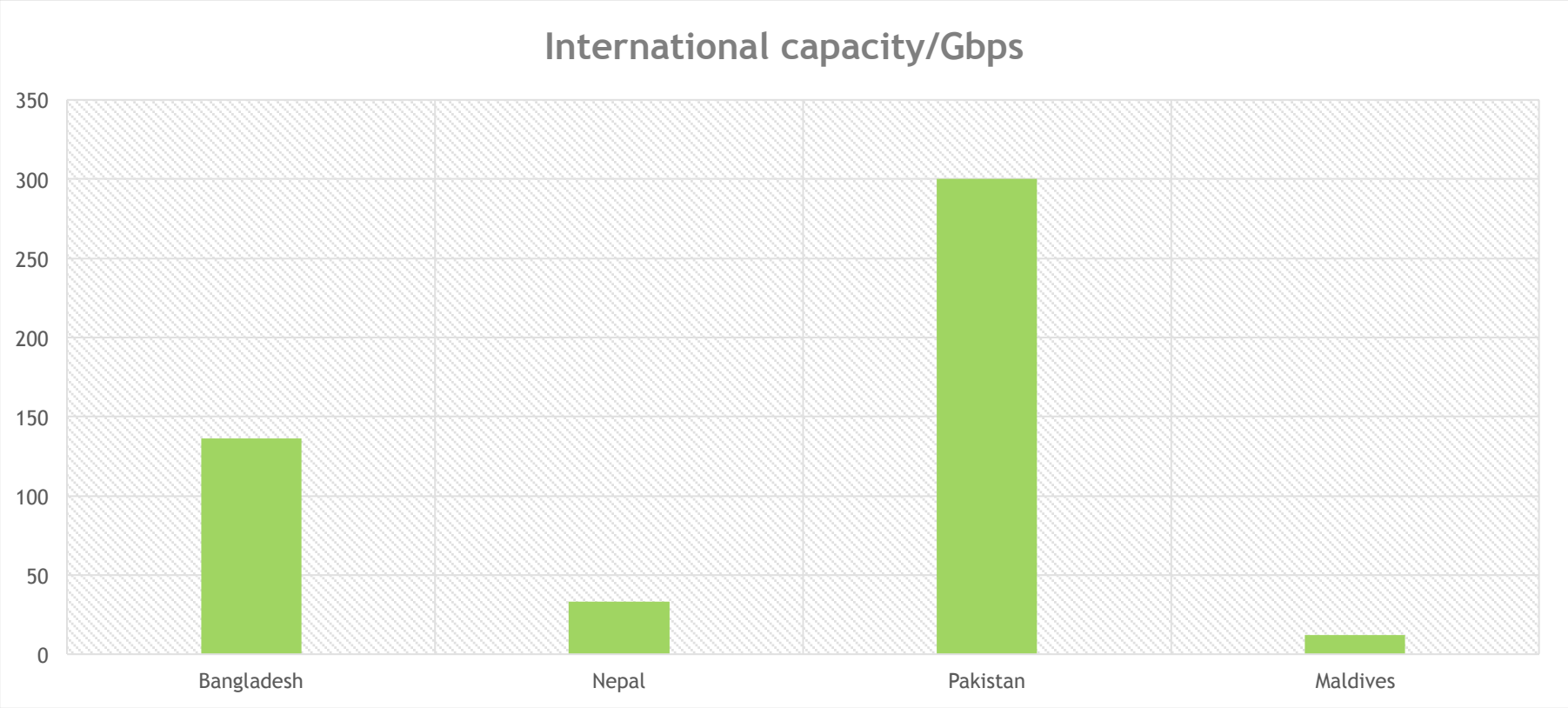
Elements of Internet Access Value Chain

- Need to look into each of the elements for affordable broadband internet

Current Situation in South Asia

- In terms of APT, South Asia covers nine countries: Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka
- Access to international connectivity is dominated by submarine cable landings
- However, Afghanistan, Bhutan and Nepal landlocked countries and do not have direct access to submarine cable landings
- A sharp disparity among the countries in terms of the bandwidth availability

Current Situation in South Asia (2)



International Capacity of some of the South Asian Countries

Current Situation in South Asia (3)

- International bandwidth cost in three landlocked countries excessively high considering their socio-economic condition
  - Afghanistan: International BW price US$35/Mbps and 1Mbps ADSL costs US$ 200/ month
  - Nepal: International BW price about US$ 32/Mbps and 384kbps ADSL costs US$ 14/ month
- Prices in Bangladesh, India, Pakistan and Sri Lanka a bit competitive. However, still much more expensive while compared to some of the ASEAN contrives such as Malaysia, Singapore and Thailand.

Some Reasons:

- Limited international bandwidth
- Exceptionally high internet transit cost
- Lack of enough internet gateways in the region
- Lack of sufficient internet exchange points (IXPs) and lack of efficiency of the current IXPs
- Backhaul capacity and expenditure
- Lack of public demand
- Right of use and permission issues
- Multiple level of taxes, fees and duties

Addressing the Reasons: International Connectivity

- International connectivity is the most critical requirement for the development of affordable internet
- Lack of the comprehensive terrestrial fiber optic connectivity in the region
- Limited options for landlocked countries. For example, Nepal and Bhutan are entirely depend on India for international connectivity
- Need to diversify the options. For example alternate connections through Bangladesh for Nepal and Bhutan
- Need to develop policy and cross-border coordination to develop sub-regional network and to assist the countries in need
  - Political willingness
  - Cooperation and initiatives from developing agencies

Addressing the Reasons: Development of National Backbone Network

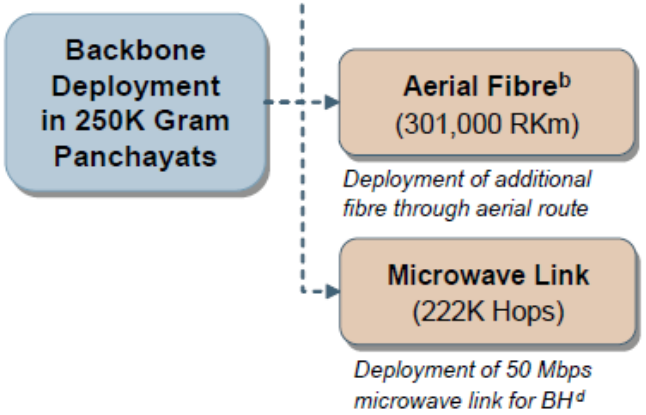
- A robust, well-designed and well-maintained high capacity national backbone network is the second key element for providing affordable internet
- Many developing countries have been engaged in such infrastructure development
- However, question remains on the design and optimization of the networks
  - Mainly developed by the private entities and business driven
  - Were not developed looking at the Government visions, taking into the needs and future demand
  - Lack of coordination and efforts of the Government with the private sector

Addressing the Reasons: Development of National Backbone Network

- Extending the high capacity infrastructure to rural areas still remains as main challenges
- Need a comprehensive policy for the development of national backbone
- A good example could be National Broadband Plan of India and its' implementation
- NOFN implementation strategy: bring 100 Mbps to each of 2.5 lacs Gram Panchayats at a investment of around 4 billion USD from USO fund

Addressing the Reasons: Development of National Backbone Network

Backhaul Deployment Options and Required Investments for Covering 250K GPs



Cost Elements	Investment Required (INR / RKm)	Total Investment (INR Crores)
• Ducting and Trenching	150,000	INR 17,500 crores
• Cable Cost and Active Equipment	130,000	
• Right of Way[a]	300,000	
• Cable Cost and Active Equipment	130,000	INR 8,500 crores
• Right of Way	150,000	
• Equipment and Installation	243,800	INR 25,392 crores[c]
• Tower Rental per Month	15,000	

Source: Industry Inputs, Analysys Mason

NOFN India-Investment Required to Rollout Backhaul Network to Connect 250,000 Gram Panchayats

Addressing the Reasons: Lack of Internet Exchange Points

- Internet Exchange Points (IXPs) are vital elements of internet infrastructure that creating the potential for a range of technical and economical benefits
- Lack of policies and strategies by the Government on IXPs in developing countries
  - Sometimes even policy makers are even unware of importance of IXPs
- Government needs to look into the institutional and operational models for IXPs
- Best practice examples are readily available

Addressing the Reasons: Access Networks

- In developing countries, particularly in South Asia Internet access dominantly by mobile networks
  - Limited by mobile network technology and as well as by radio spectrum availability for such technology
- For a sustainable growth in Internet, no alternative than fixed access network (via DSL/ADSL/VDSL or fiber optic), specially in dense urban areas
- The recent improvement in fixed access networks in countries like Malaysia and Thailand has brought down the internet price drastically
  - In Thailand, >50Mbps FTTH connection is available for only US$ 30/per month for unlimited data

Addressing the Reasons: Access Networks

- In South Asian countries, Governments and policy makers need to think their strategies and encourage investments for such investment in fixed access network
  - May be in big mega cities like Delhi, Kolkata, Mumbai, Dhaka, Chittagong, Kathmandu, Lahore, Tehran and others
  - Bottleneck could be right of ways and inadequate cooperation among the agencies
- For the enhancement of mobile access networks, policy makers need to have clear plan to
  - Adopt new technology evolutions without delay
  - Make long term strategy for radio spectrum through Spectrum Roadmap

Addressing the Reasons: Internet Content

- Developing content is another important issue in order to increase the use of Internet
- Key emphasis should be given on the development of content in local languages
- Further, in order to improve the internet traffic flow and avoid expensive international connectivity content should be host locally
  - In developing countries locally host content is very limited

Addressing the Reasons: Internet Content

- Policy makers need to encourage to conduct survey on the behavior and interest of internet users for
  - Predicting future demand and
  - Management of internet traffic
- It can help policy makers/ISPs to negotiate with giant content providers to use web content cache
  - Thus speed up internet speed and reduce cost of bandwidth

At The End:

- Developing countries have less resources and a strategy how they can be better off is important.
- Developing agencies need to combine their efforts and support those countries addressing their needs
- Collaborative approach would made it possible to achieve the target to provide affordable broadband for all
- Lets work together to deliver the best!!

THANK YOU!

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