



Unleashing the Potential of the Internet - Indian Case Study

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Presentation flow

Introduction

Broadband growth worldwide and in India

Broadband Targets and Drivers

Key Challenges

Steps taken for accelerating Broadband proliferation



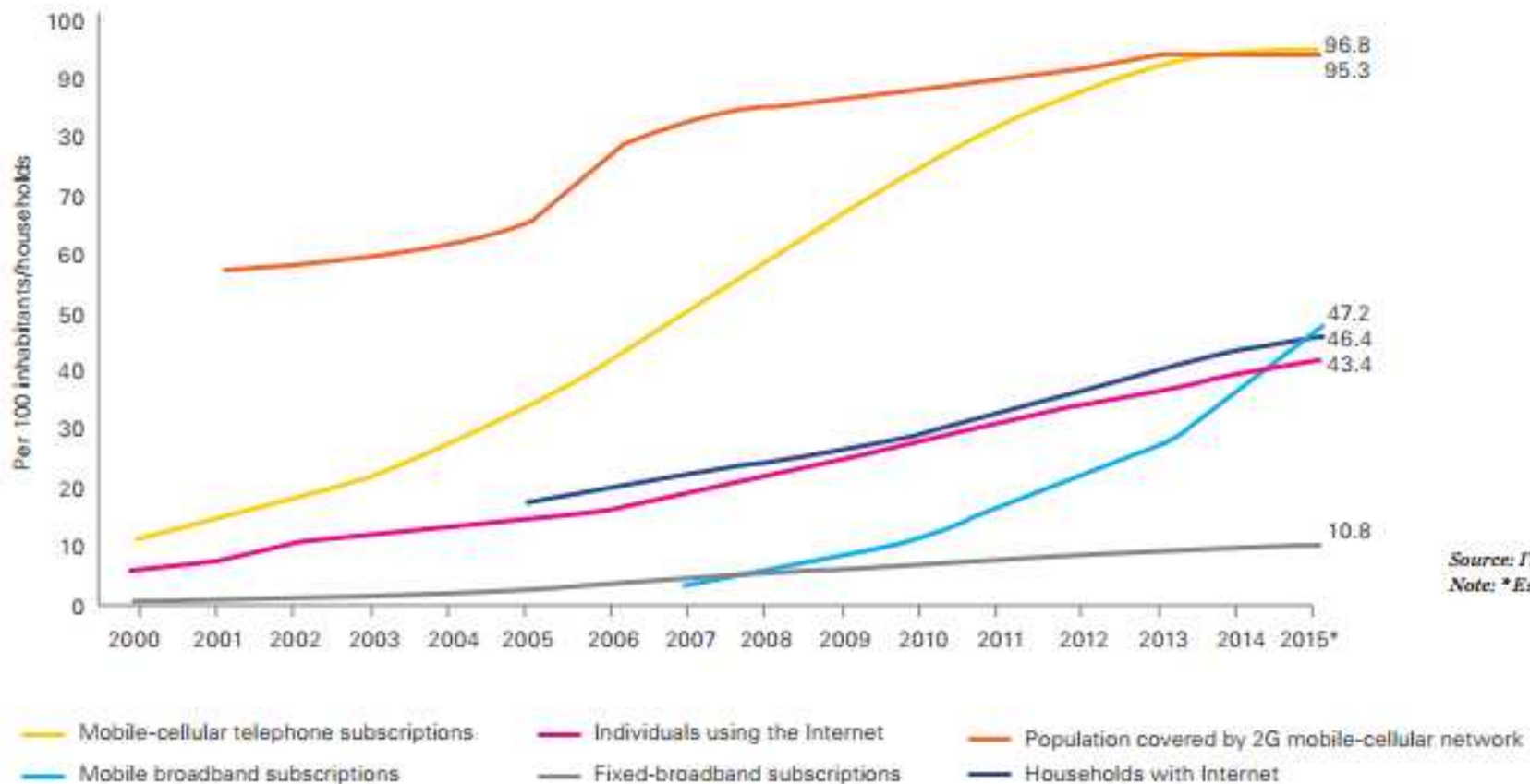


Broadband impacts all facets of life





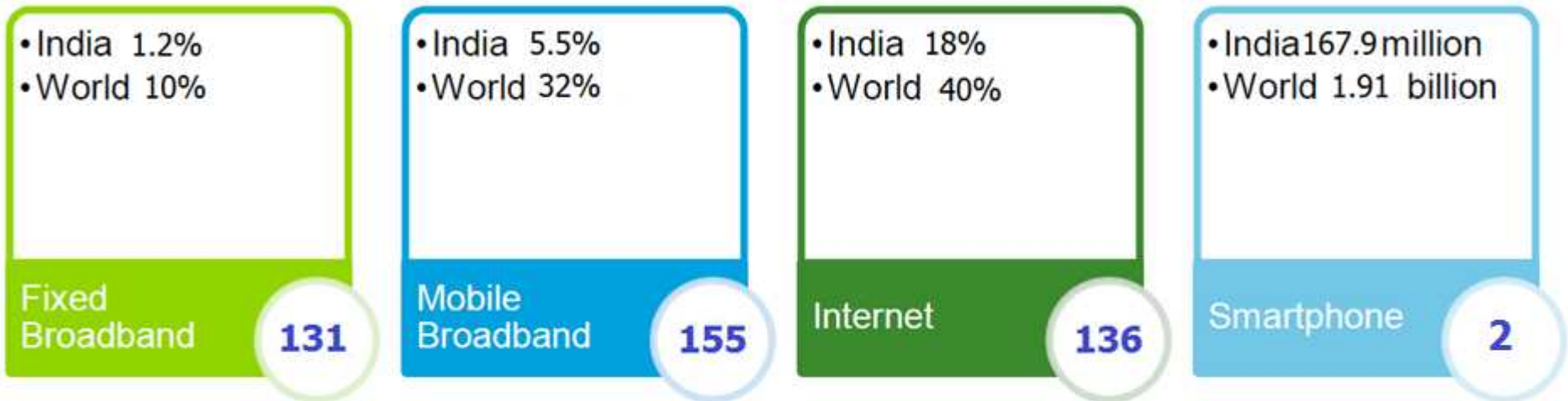
ICT Growth Worldwide



At the beginning of 2016, only an estimated 3.2 billion people — 44 percent of the world’s population — are online and connected to the digital economy



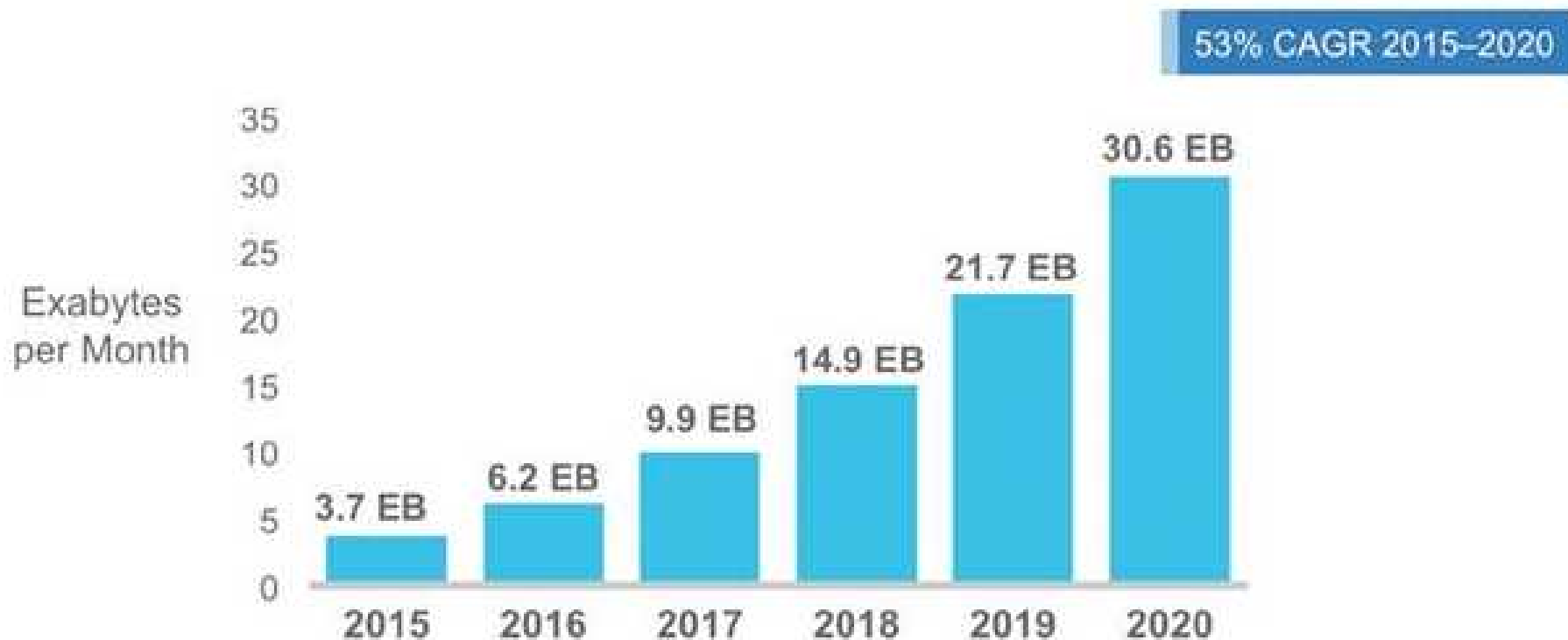
INDIA'S RANKING IN THE WORLD



Source: A report by the Broadband Commission 2015

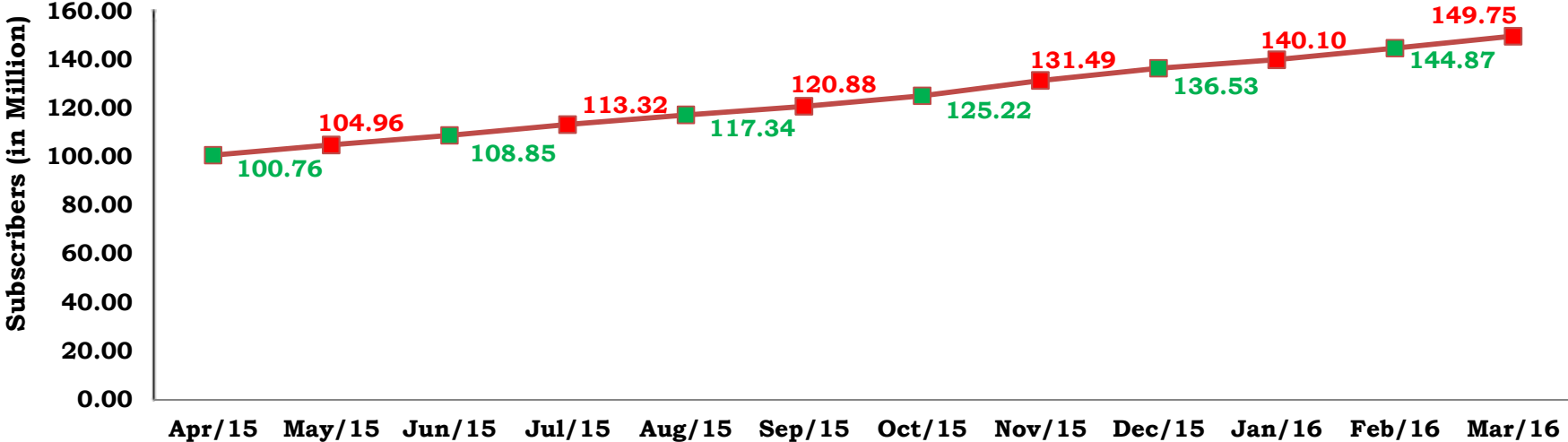


Global Mobile Data Traffic forecast

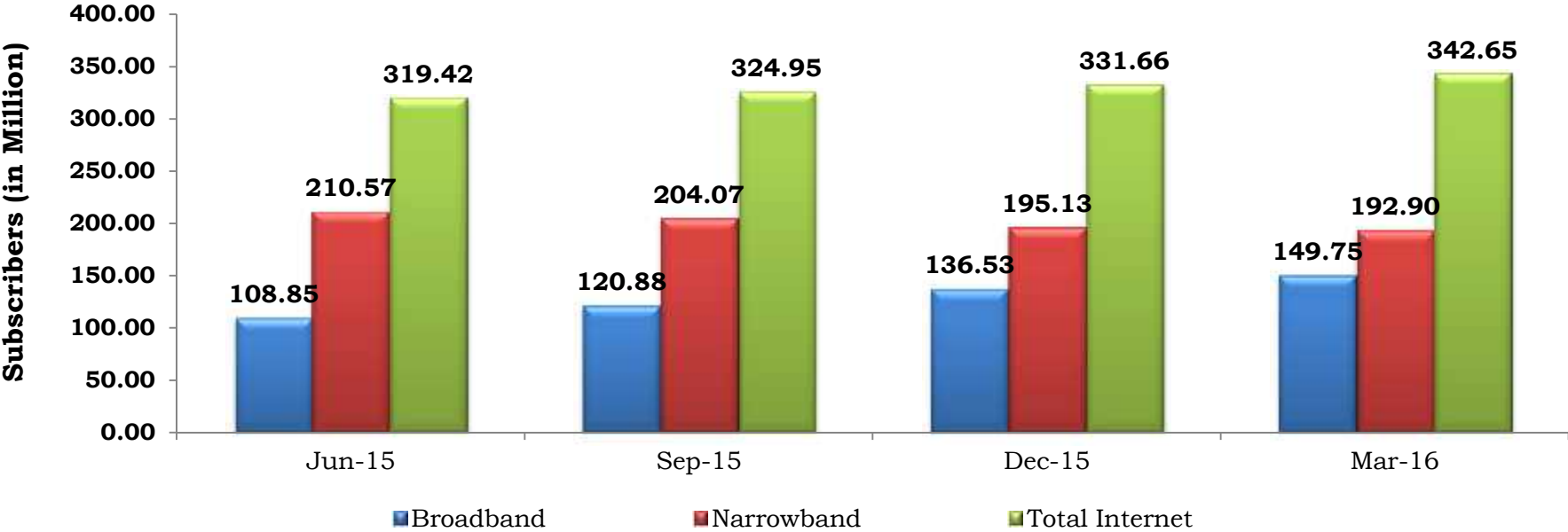


Source: Cisco VNI Mobile, 2016

Broadband Growth in India



Broadband and Narrowband Subscribers



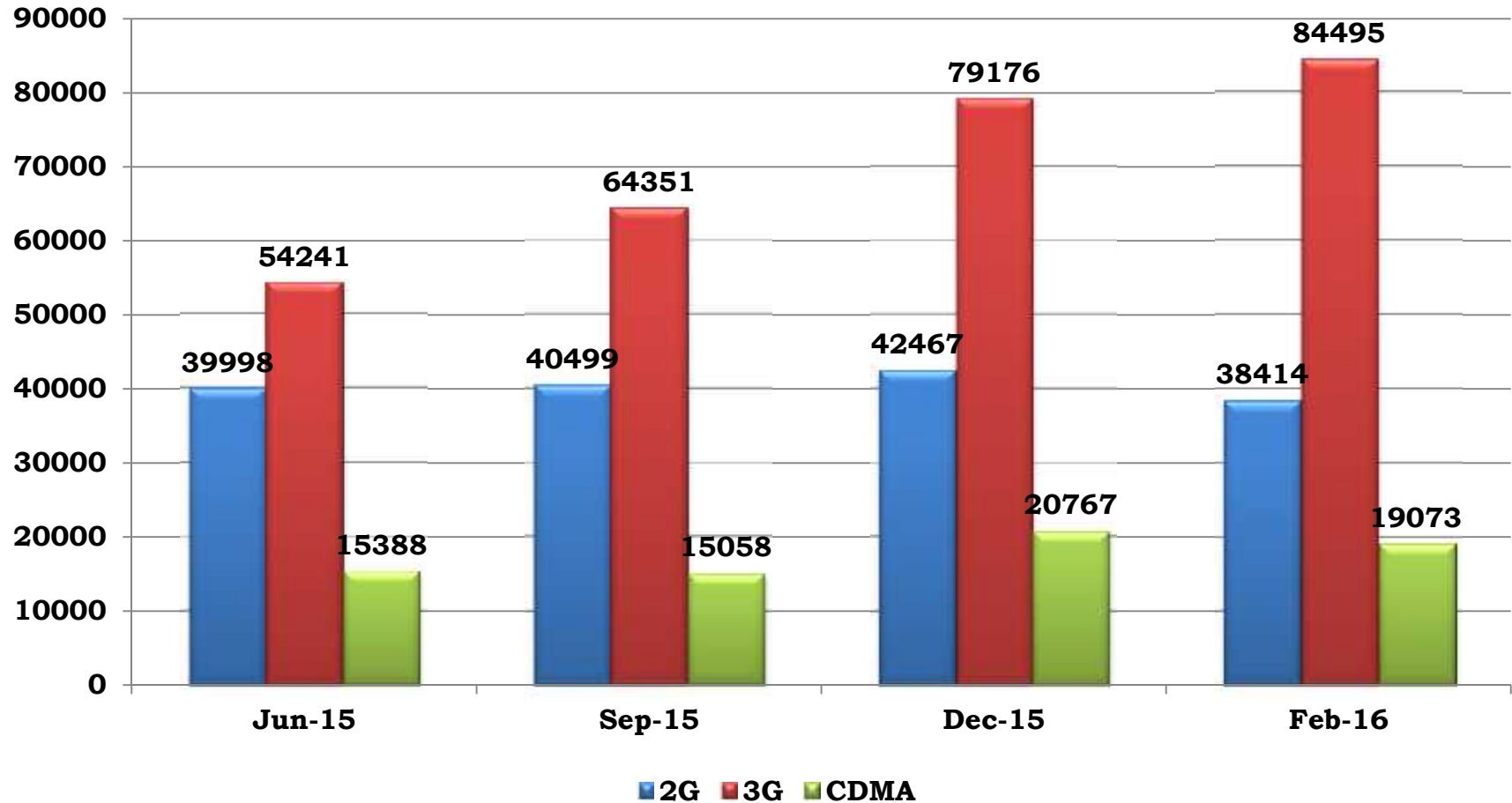


Mobile data Forecast: India

- In India, mobile data traffic will grow 12-fold from 2015 to 2020, a compound annual growth rate of 63%. (CISCO)
- In India, mobile data traffic will reach 1.7 Exabytes per month by 2020 (the equivalent of 430 million DVDs each month), up from 148.9 Petabytes per month in 2015. (CISCO)
- Mobile data traffic in India is expected to grow the fastest globally at 15 times by 2021 (Ericsson, Report, November 2015)



Data Usage (in TB)



*Broadband is a data connection that is able to support interactive services including Internet access and **has the capability of the minimum download speed of 512 kbps** to an individual subscriber from the point of presence (POP) of the service provider intending to provide Broadband service.*








Broadband Targets

- **National Telecom Policy - 2012 Vision**

- Boost broadband subscription to 175 million by 2017 and to 600 million by 2020
- Deliver a minimum download speed of 2Mbps, with speeds of 100Mbps or more available on demand
- Increase rural telecom penetration to 70 percent by 2017 and to 100 percent by 2020



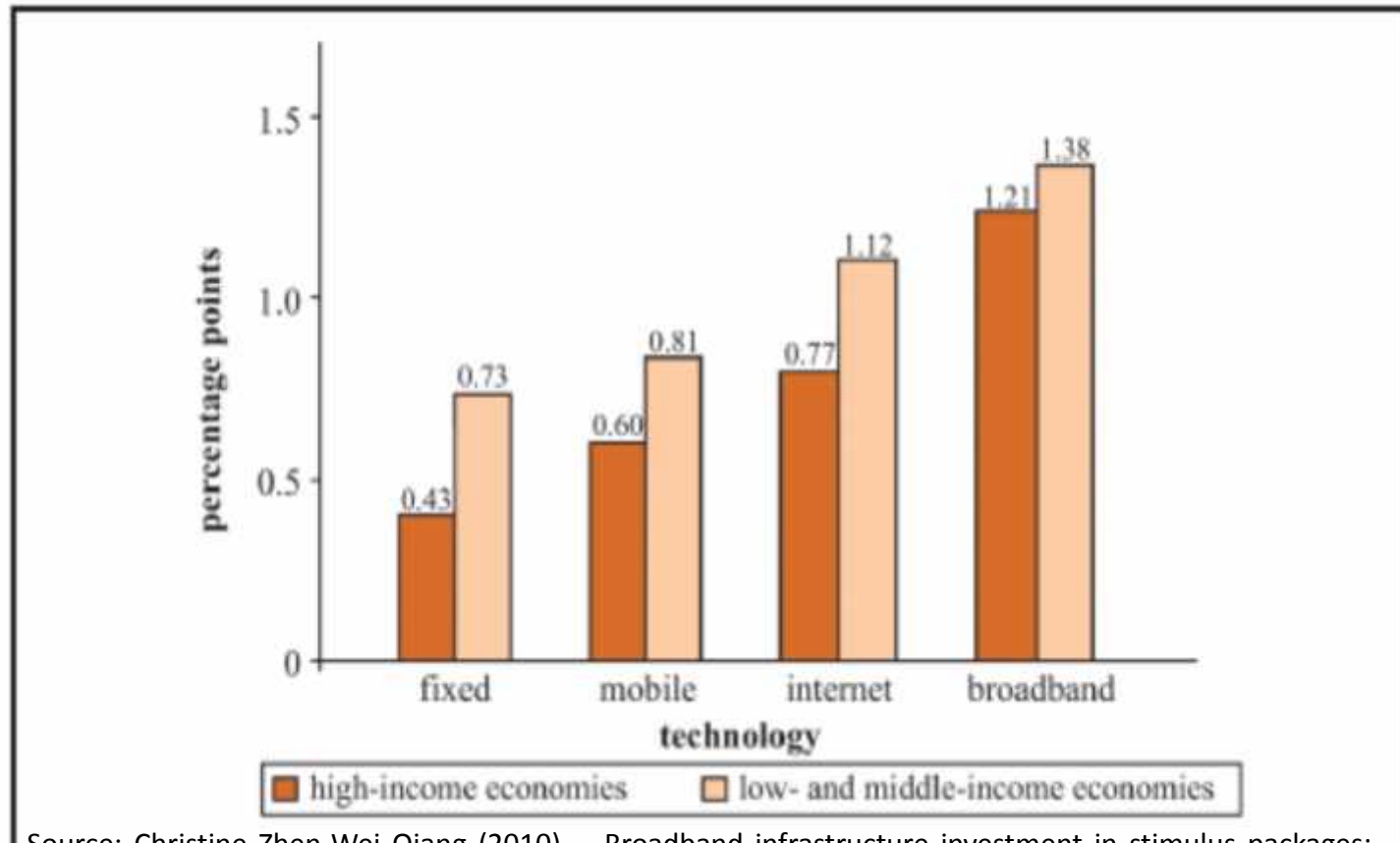
BROADBAND TARGETS OF DIFFERENT COUNTRIES

	Established the Broadband Delivery UK			25+Mbps 90% coverage	25+Mbps 95% coverage	25+Mbps 100% coverage		
	Singapore began Next Gen NBN project to bring FTTH		100 Mbps 95% coverage	100 Mbps 100% coverage				
	Australia began NBN project in PPP model	100 Mbps 28% coverage					100 Mbps 93% coverage	
	India began NOFN project			100 Mbps 50,000 Gram Panchayats	100 Mbps 250,000 Gram Panchayats	2 Mbps 100% coverage		
		China began Broadband China project		4 Mbps rural 20 Mbps urban		12 Mbps rural 50 Mbps urban		
	2009	2010	2013	2014	2015	2017	2020	2021

Source: Country regulator websites, Industry News



Impact of Broadband penetration on GDP



Source: Christine Zhen-Wei Qiang (2010) - Broadband infrastructure investment in stimulus packages: relevance for developing countries- Emerald Insight

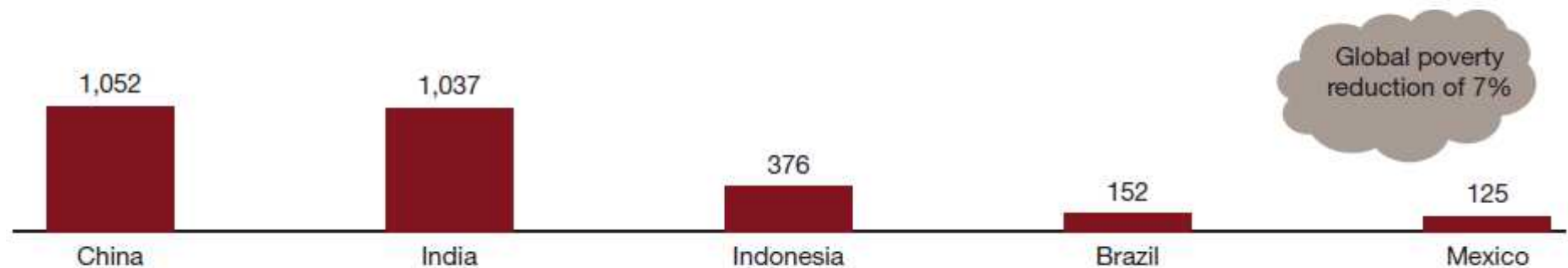
Developing countries will get more benefit from higher broadband penetration.



Economic impact of Universal Internet access

Universal Internet access would add substantially to GDP in major developing countries by 2020

Additional Cumulative GDP Growth from Achieving 100% Internet Penetration
(In US\$ Billions [2014 dollars], Selected Countries, 2015–2020)



Note: Data based on a multivariate analysis conducted using a classic production function, with Internet penetration as a variable. Dataset across 120 countries for six years.

Achieving universal Internet penetration could expand world output by \$6.7 trillion.

- Source: PWC 2016 report on Connecting the world & Ten mechanism for Global inclusion

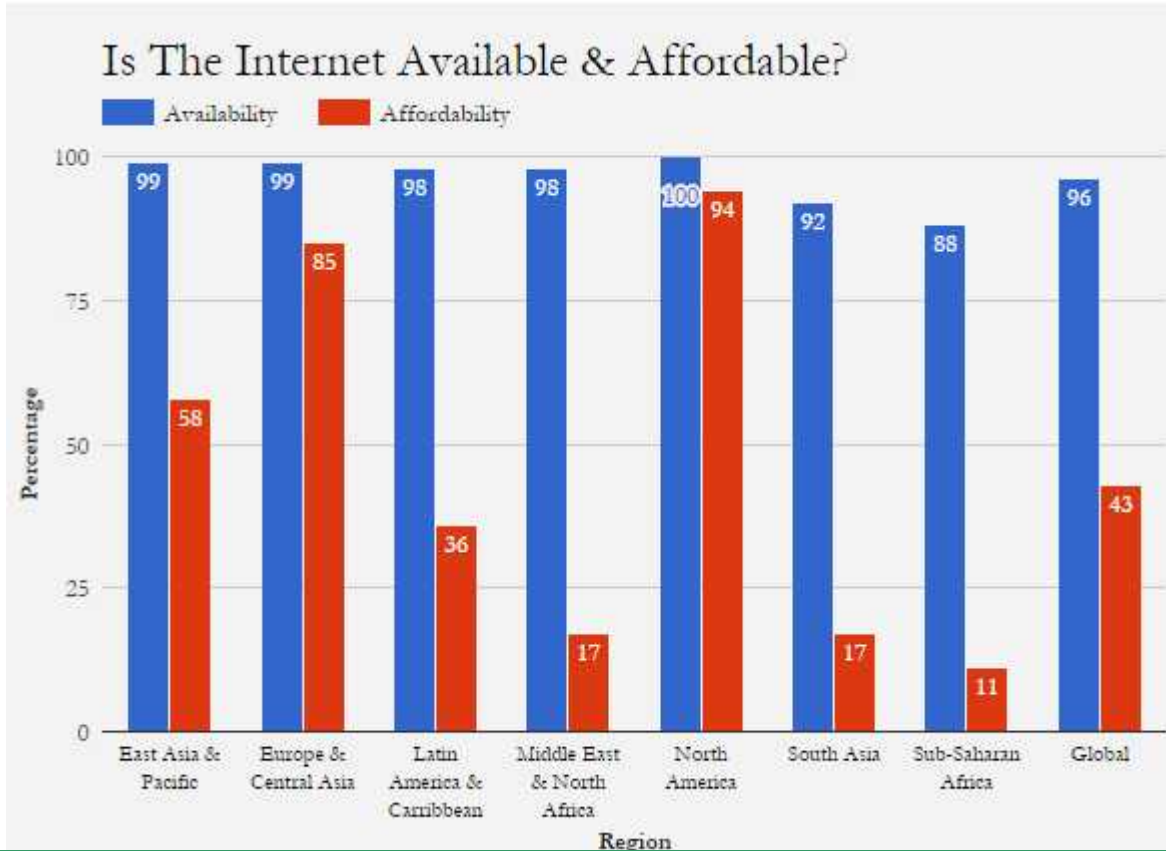


Key Challenges in Broadband Growth

- **Spectrum related issues**
 - Maximise spectrum resources: Increase supply of spectrum to meet demand
 - Increase efficiency of existing spectrum usage
 - Insufficient spectrum for backhaul
 - Licensing Innovations: Opening of new bands under light touch regulations or no regulations (unlicensed bands)
 - Fragmented spectrum
 - Un-liberalised spectrum with many operators.
- **Infrastructure Constraints**
 - RoW
 - EMF Radiation perception
 - Result : Poor penetration and Slow speed
- **Device Affordability: 3G & 4G**
- **Lack of contents, mainly in local language**
- **Lack of awareness of benefits**



Data Costs



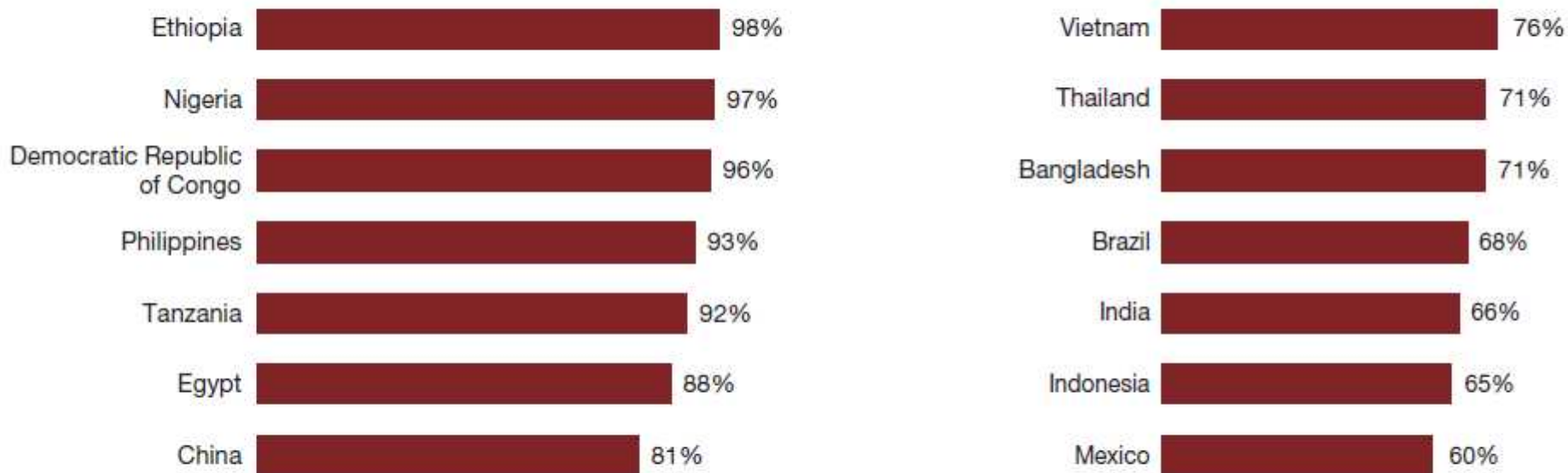
Note: Availability refers to percentage of population within the range of a 2G network. Affordability refers to the percentage of population for whom a 500 MB data plan costs 5% or less of their monthly income.

Prices need to drop by close to 70% of today's average retail price for 80% of the world's population — Source: : PWC 2016 report on Connecting the world & Ten mechanism for Global inclusion



Internet plan prices need to be slashed to achieve widespread affordability

Price Reduction Needed for the Internet to Be Affordable for 80% of the Population

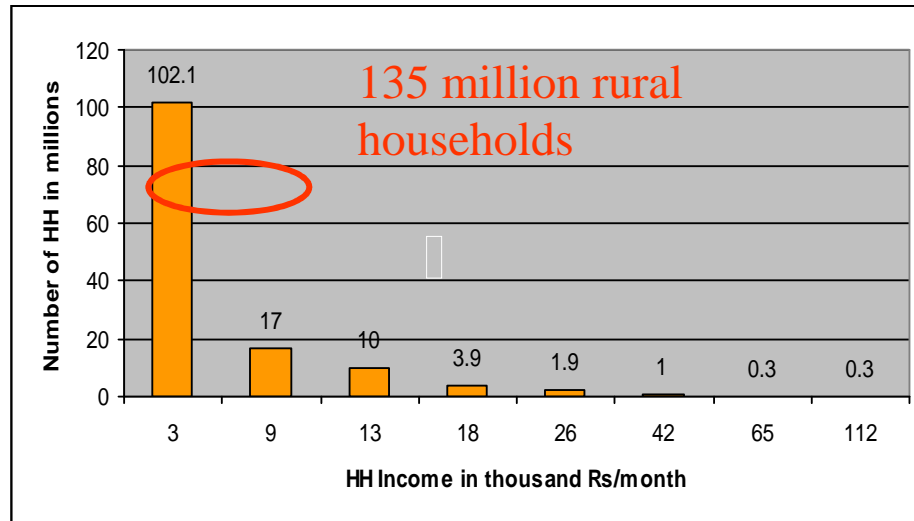


Note: Assumes cost is less than 5% of gross monthly income, prepaid price in purchasing power parity US\$ for 500 MB.

- Source: PWC 2016 report on Connecting the world & Ten mechanism for Global inclusion

Rural India has 833 million people*

- As per NSSO, in 600,000+ villages About 60 per cent of India's rural population lives on less than Rs 35 a day)



Source:<http://www.tenet.res.in>

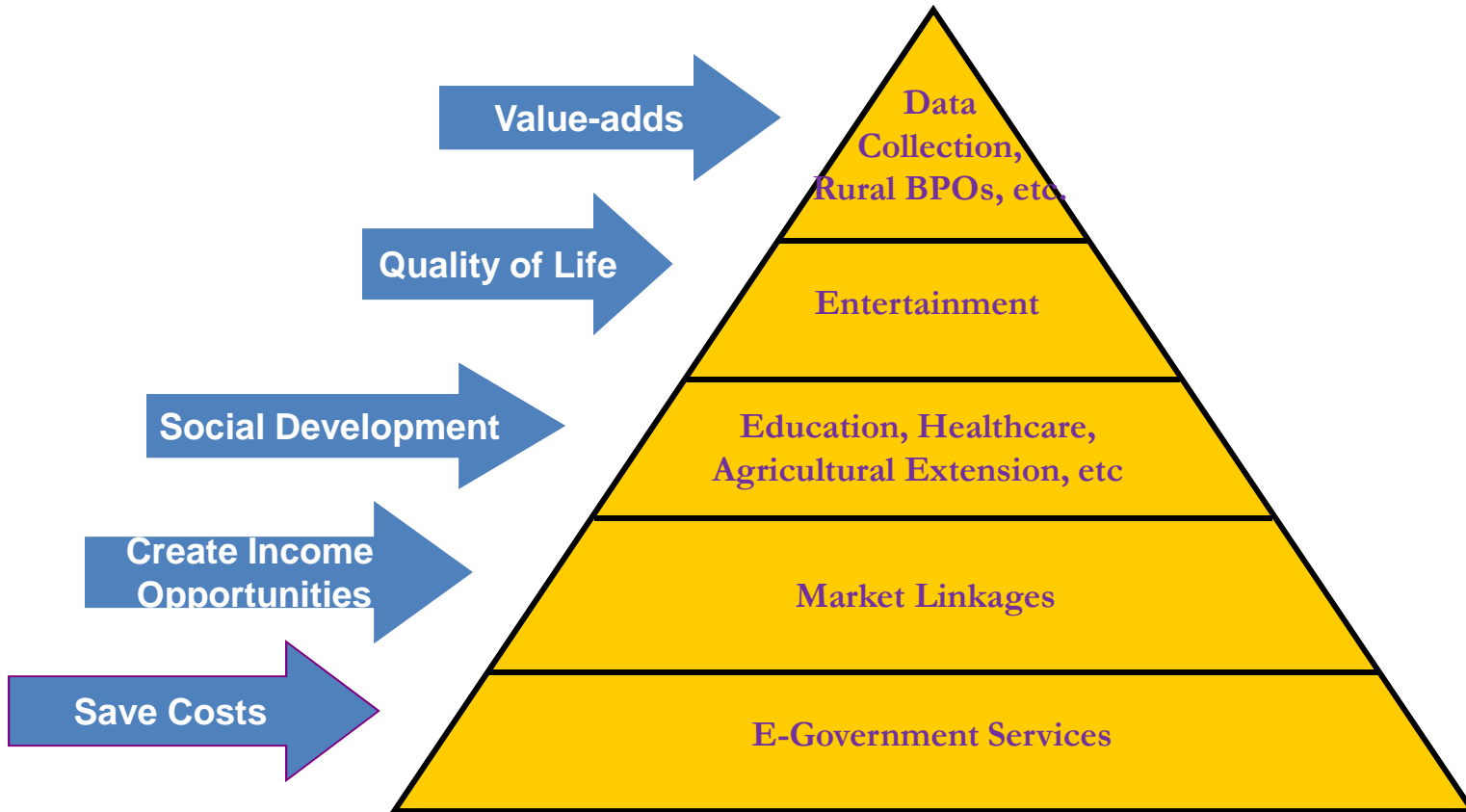
* Census of India, 2011



- **Can technologies make a significant difference in life of such people?**
 - Support them for Health and Education
 - Help to significantly enhance their incomes?
 - e-Governance and e-Agriculture
 - Digitization of cable TV in conjunction with National Broadband Plan.



The Services Model of a CSC



The power of the CSC would lie in its focus on content customization and multi-lingual delivery of End-to-End Services



What is Digital India?

- **Flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy.**
- The focus is on being **transformative—to realize IT + IT = IT**
- The focus is on making **technology central to enabling change.**
- It is an **Umbrella Programme—covering many departments.**
 - It weaves together a large number of ideas and thoughts into a **single, comprehensive vision so that each of them is seen as part of a larger goal.**
 - Each individual element stands on its own. But is also part of **the larger picture.**
 - The weaving together makes the Mission **transformative in totality**



Digital India Programme

- **Key vision areas:**



Digital Infrastructure as a utility to every citizen



Governance and Services on Demand



Digital Empowerment of citizens



Infrastructure as a utility to every citizen

- **High speed internet as a core utility**
- **Cradle to grave digital identity -unique, lifelong, online, authenticable**
- **Mobile phone & Bank account enabling participation in digital & financial space**
- **Easy access to a Common Service Centre**
- **Shareable private space on a public cloud**
- **Safe and secure Cyber-space**



Governance and Services on Demand

- **Seamlessly integrated across departments or jurisdictions**
- **Services available in real time from online & mobile platform**
- **All citizen entitlements to be available on the cloud**
- **Services digitally transformed for improving Ease of Doing Business**
- **Making financial transactions electronic & cashless**
- **Leveraging GIS for decision support systems & development**



Digital Empowerment of Citizens

- Universal **Digital Literacy**
- Universally accessible **digital resources**
- **All documents/ certificates to be available on cloud**
- Availability of digital resources / services in **Indian languages**
- **Collaborative digital platforms for participative governance**
- **Portability of all entitlements through cloud**



Pillars of Digital India Programme





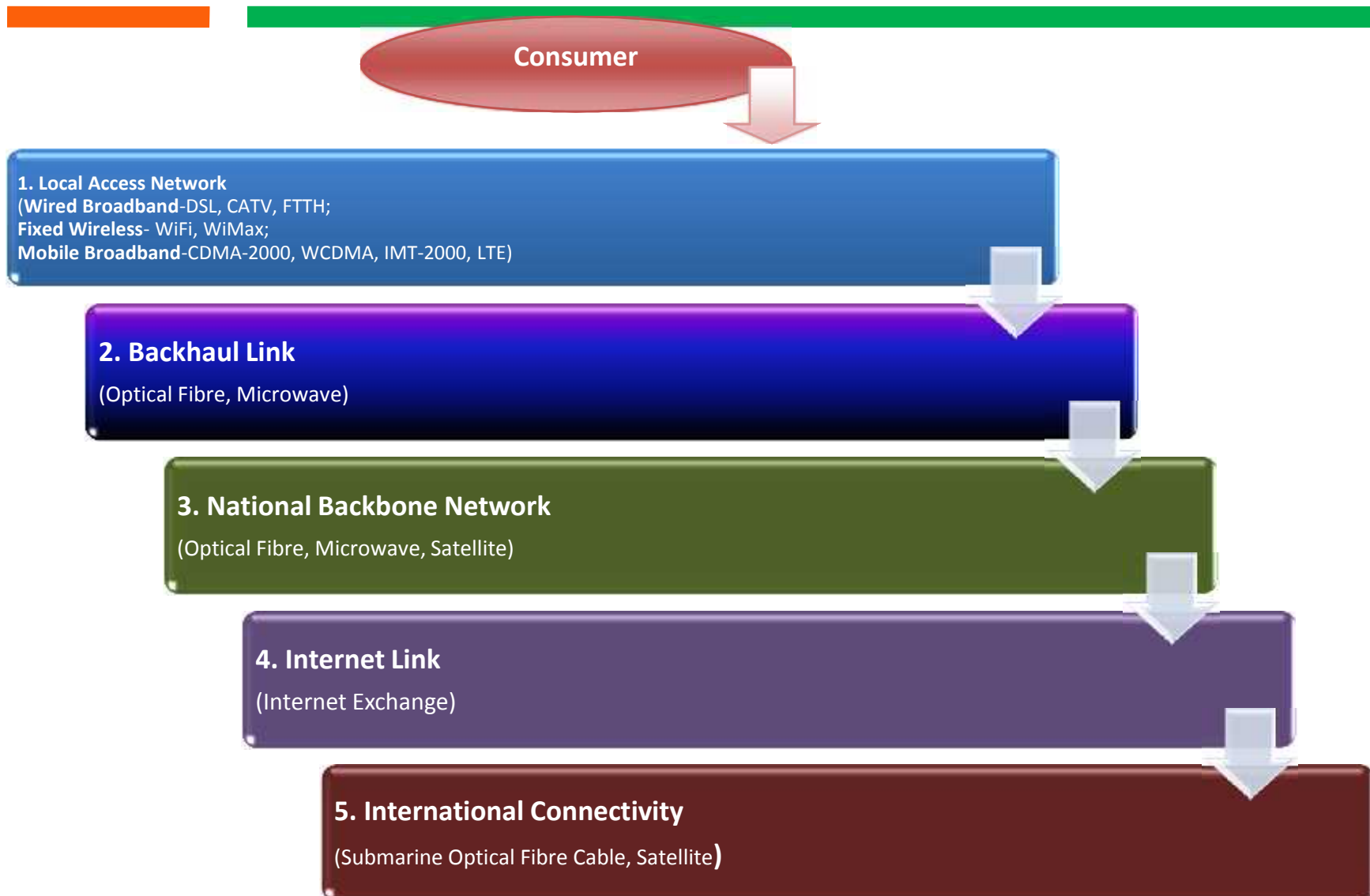
Economic Impact of Digital India

- **Increase the broadband penetration across India (current ~7%) by 50% and mobile penetration in rural India (current ~45%) by 30% in next 2 years, the corresponding increase in GDP could be 9% (~\$180 billion).**
 - This impact is only of 2 out of 9 pillars of Digital India project.
 - Adding to this growth and prosperity would be the impact of other pillars that would empower the citizens with gamut of services at their fingertips.
- **Digital India plan could boost GDP up to \$1 trillion by 2025.**

(Deloitte Report on Digital India Unleashing Prosperity, 2015)



Broadband Supply Chain





National Broadband Plan

National Broadband Network (NBN)

- An open access optical fibre based National Broadband Network will be established.
- To be established in two phases:
 - Phase I : covering all cities, urban areas and Gram Panchayats by the year 2012.
 - Phase II: all habitations having a population more than 500 by the year 2013.
- The objective of national broadband Network is to provide :
 - Fibre to home in 63 major cities
 - Fibre to kerb in all other cities (0.5Km from any residence) .
- National Broadband Network will support following bandwidth:
 - 10 Mbps download speed in 63 Metro and large cities by the year 2014
 - 4 Mbps in 352 cities by the year 2014
 - 2 Mbps in towns and villages by the year 2014



National Broadband Plan - India

Funding Source

- This network will be established at a cost of about 14 billion USD.
- It will be financed by: USO fund and the loan given/ guaranteed by Central Government

The Optical fibre network so created is expected to boost the broadband growth.

Targets 2014

- 160 million broadband households:
 - 22 million DSL,
 - 78 million cable TV network
 - 60 million wireless



Current Status of National Broadband Plan

- Government had approved the National Optical Fibre Network (NOFN) on 25.10.2011 for providing broadband connectivity in rural areas to connect 2,50,000 Gram Panchayats (GPs) through OFC.
- NOFN project will bridge connectivity between Gram Panchayats(GPs) and Block level. This project will provide guaranteed bandwidth of 100 Mbps at Gram Panchayats (GPs).
- To execute NOFN project, Government has set up 'Bharat Broadband Network Ltd' (BBNL) which will be funded from the Universal Service Obligation Fund



Current Status of BharatNet



S.No	State	Gram Panchayats connected
1	ANDHRA PRADESH	15
2	ASSAM	128
3	BIHAR	215
4	CHANDIGARH	12
5	CHHATTISGARH	522
6	GUJARAT	116
7	HARYANA	160
8	JHARKHAND	136
9	KARNATAKA	2,889
10	KERALA	1,129
11	MADHYA PRADESH	150
12	MAHARASHTRA	199
13	ODISHA	104
14	PUDUCHERRY	100
15	RAJASTHAN	308
16	TELANGANA	106
17	TRIPURA	79
18	UTTAR PRADESH	202
19	UTTRAKHAND	183
Total GPs connected		6,753

OFC laid-1,11,729 kms; GPs connected with OFC-50,465; GPs provided Broadband-6,753



THANK YOU



Global Mobile Data Traffic Forecast by Region



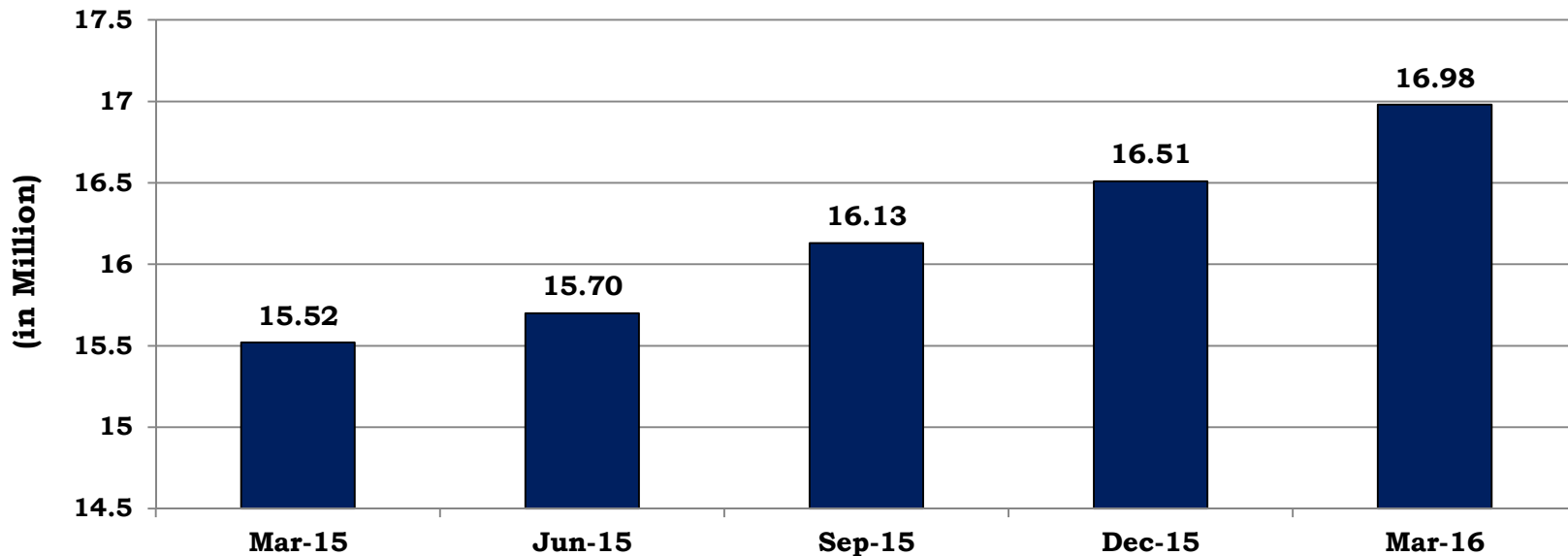
Source: Cisco VNI Mobile, 2016



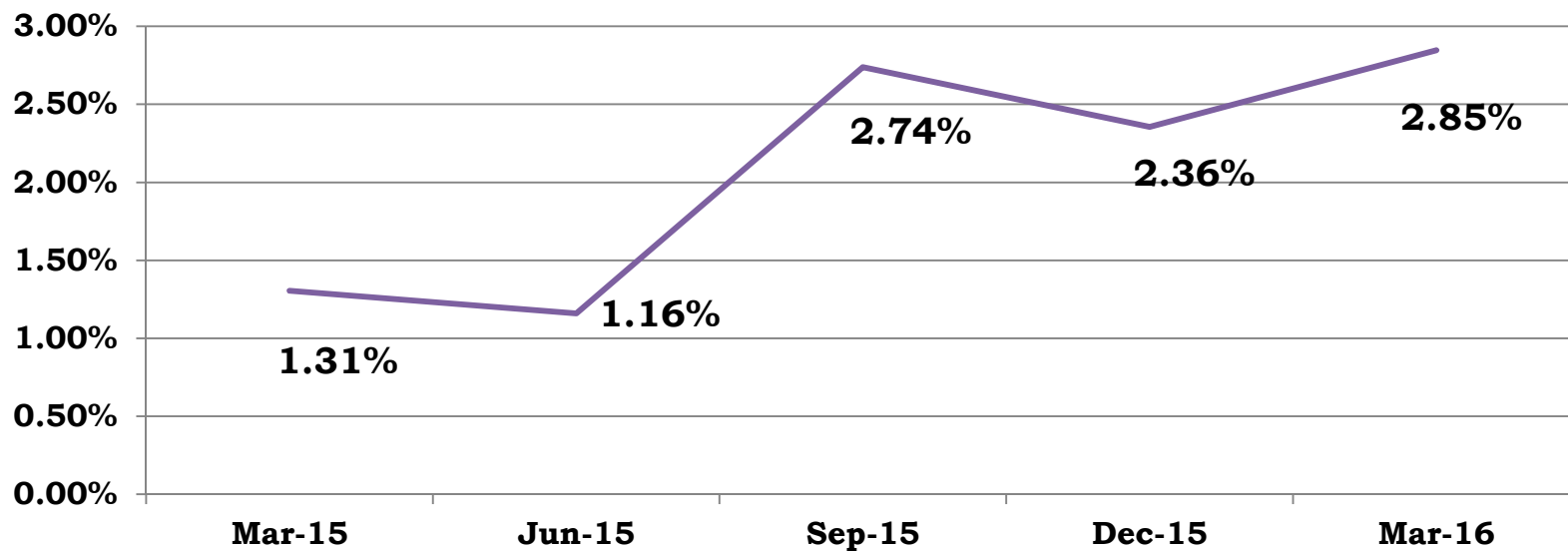
STEPS SUGGESTED BY TRAI

- Recommendations for having larger spectrum in de-license band with de-licensing of 60 GHz band, for high speed broadband in Wi-Fi areas
- Introduction of Virtual Network Operators (VNOs) in telecom sector for allowing niche operators to come in the market using the networks of the existing operators.
- Recommendations on “Implementation Strategy for BharatNet” on 1st February, 2016 recommending BOOT/BOT model as preferred means of implementation.
- Encourage provisioning of broadband services using Cable TV services.

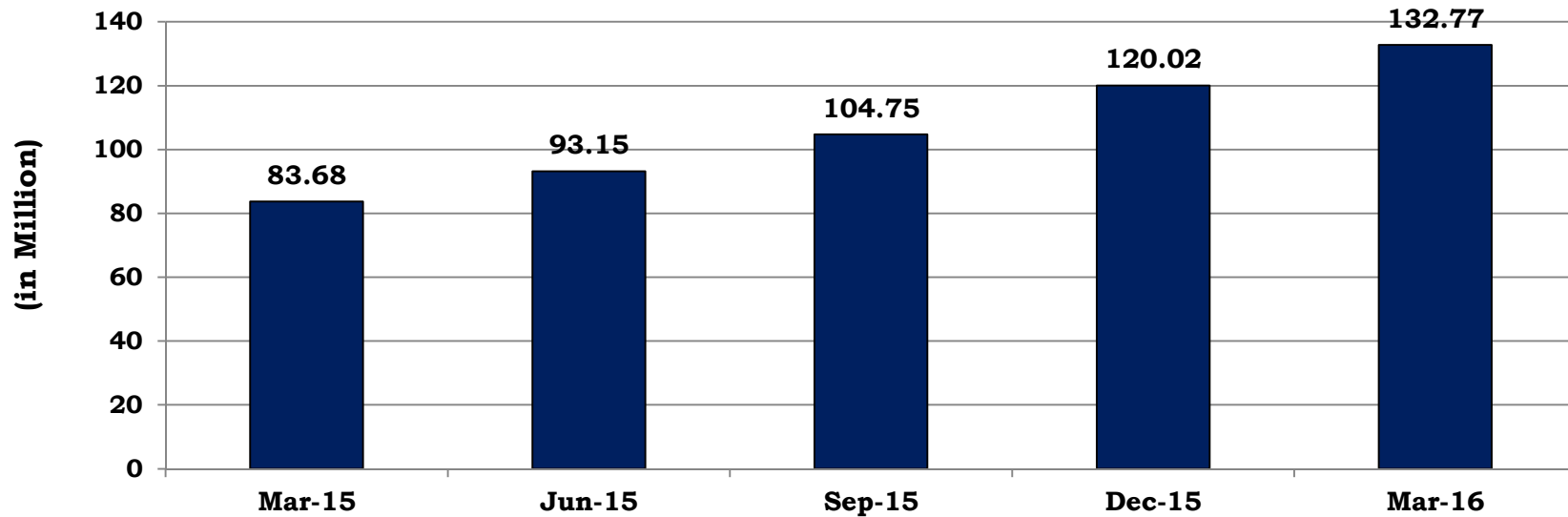
Wired Broadband Subscribers



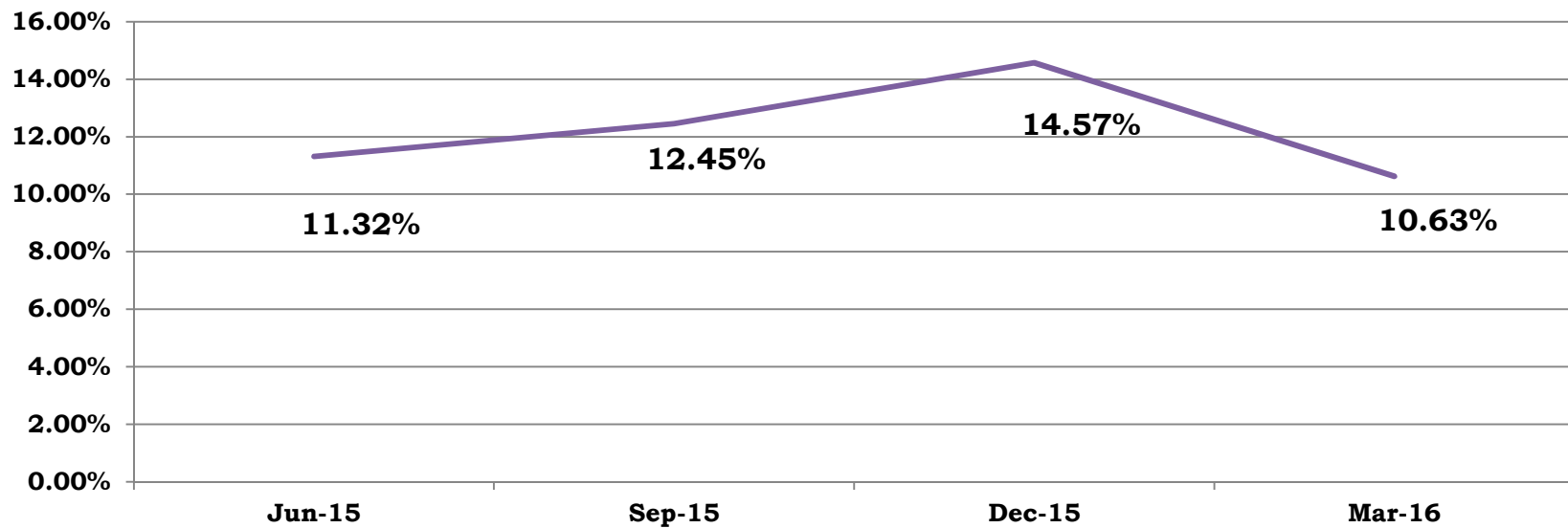
Wired Broadband Growth %



Wireless Broadband Subscribers



Percentage Growth of Wireless Broadband





National Broadband Plan - India

Benefits

- Easy access to high speed data and information to citizens
- Promoting the efforts in the field of education, health , commerce , banking etc.
- Expected to provide high quality and reliable broadband network
- Provide lead to digital economy
- Enhance Participation of people in governance
- Generate additional revenue for the Government
- Boost to cable TV industry
- Effective disaster management, weather forecasting etc
- It enables various monitoring including environmental monitoring, Smart Monitoring (e.g. traffic, playground) etc.
- Ability to work from home facilitating reduced load on transportation.
- Creates employment opportunities- 5 lakh employment in 2.5 lakh GPs by 2015



BROADBAND DEMAND DRIVERS

