



The Mobile Economy India 2016



About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.

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CONTENTS

EXECUTIVE SUMMARY	2
1 INDIA MOBILE MARKET OVERVIEW	6
1.1 India to add over 330 million mobile subscribers by 2020	6
1.2 Technology shift to high-speed broadband accelerates as 4G arrives	7
1.3 'Make in India' programme supports local manufacturers driving smartphone adoption	9
1.4 Data consumption grows as social networking and online services gain popularity	10
1.5 Operator financials show signs of recovery but deeper problems persist	12
2 ECONOMIC CONTRIBUTION OF THE MOBILE INDUSTRY	14
3 DIGITAL INDIA: DELIVERED THROUGH MOBILE BROADBAND	20
3.1 Mobile delivering digital inclusion	22
3.2 Mobile delivering financial inclusion	23
3.3 Mobile delivering digital identity	24
3.4 UN Sustainable Development Goals and mobile operator initiatives	25
4 REFORMING REGULATION TO ACCELERATE MOBILE BROADBAND ADOPTION	28
4.1 Modernising regulation for Digital India	30
4.2 A long-term plan for spectrum required	30
4.3 Reducing costs of doing business	31
4.4 Improving the ease of doing business	32

Executive Summary

India to see increased connectivity and mobile broadband uptake

At the end of June 2016, 616 million unique users subscribed to mobile services in India, making it the second largest mobile market in the world. Almost half the country's population now subscribe to a mobile service. Improving affordability, falling device prices and better network coverage aided by operator investment will help deliver over 330 million new unique subscribers by 2020, taking the penetration rate to 68%.

India is now the world's second largest smartphone market, overtaking the US in the first half of 2016, with an installed base of 275 million as of June 2016. India is also seeing an ongoing technology shift to mobile broadband services. With a gradual reduction in data tariffs and growing availability of affordable smartphones for consumers, the mobile broadband connection base is forecast to reach more than 670 million by 2020. By this date, almost half of the total connections will run over mobile broadband networks. There is also an accelerating move to 4G, with the 4G connection base forecast to grow rapidly, from just 3 million at the end of 2015 to 280 million by 2020.

Impact of competition and network investments to keep margins under pressure

The last few years have seen some recovery in financial performance for the sector overall, but competition has kept effective price per minute and ARPU levels at amongst the lowest in the region. Mobile revenues are expected to show solid growth over the next few years, with service revenue growth for the period to 2020 forecast at a CAGR of 6%.

Operators are increasingly looking to offset the impact of competition and slowing subscriber growth by monetising the growth in data traffic. As more users migrate to high-speed broadband, mobile data traffic is expected to grow 12-fold between 2015 and 2020, at a CAGR of 63%. Mobile operators in India have so far reported limited revenue contribution from data services, generating 17% of service revenues at the end of 2015. This is forecast to increase to 23% by 2020, still well below advanced countries in Asia Pacific, which are in the 30–35% range.

Operators have made capex investments worth INR154,100 crore (\$23 billion) over the last five years, a figure forecast to increase sharply to total around INR227,800 crore (\$34 billion) for the period to 2020. Operating cashflow margins in India stood at just over 12% in 2015, well below both the global and regional averages. Competitive pressures and network investments mean cashflow margins in India will remain subdued, highlighting the need for consolidation if operators are to justify the high levels of investment required to support ongoing mobile broadband network expansion.

Mobile industry contributing to the digital economy

In 2015, the mobile industry was responsible for 6.5% of India's GDP, a contribution that amounts to more than INR9 lakh crore (\$140 billion) of economic value added. Mobile operators and the ecosystem provided direct employment to approximately 2.2 million people in India across both the organised and unorganised sectors, while approximately 1.8 million jobs were indirectly supported. The mobile ecosystem also makes a highly significant contribution to the funding of the Indian public sector, with approximately INR1.4 lakh crore (\$21 billion) in 2015.

The Indian government's Digital India initiative was launched in 2015 and aims to use the potential of digital technologies to address some of the significant socioeconomic challenges in the country. Mobile networks and the broader mobile ecosystem are helping to address the goals of Digital India. A new regulatory regime for mobile money should help accelerate moves to improve financial inclusion in the country: four of the eight licensees for the new payment banks are operator led (with a combined footprint of more than 620 million mobile connections).

Mobile is already the dominant platform for internet access and will play a pivotal role in delivering the Digital India vision of broadband as a utility for every citizen. As of mid-2016, around 430 million had access to mobile internet services, a figure that will increase to almost 670 million by 2020. This is equivalent to around half the population but will still leave India trailing the regional average of 63% penetration.

Despite progress to date, mobile operators and the mobile ecosystem have the capacity to make a much greater contribution to delivering the Digital India initiative and continue to seek a greater role in the overall programme.

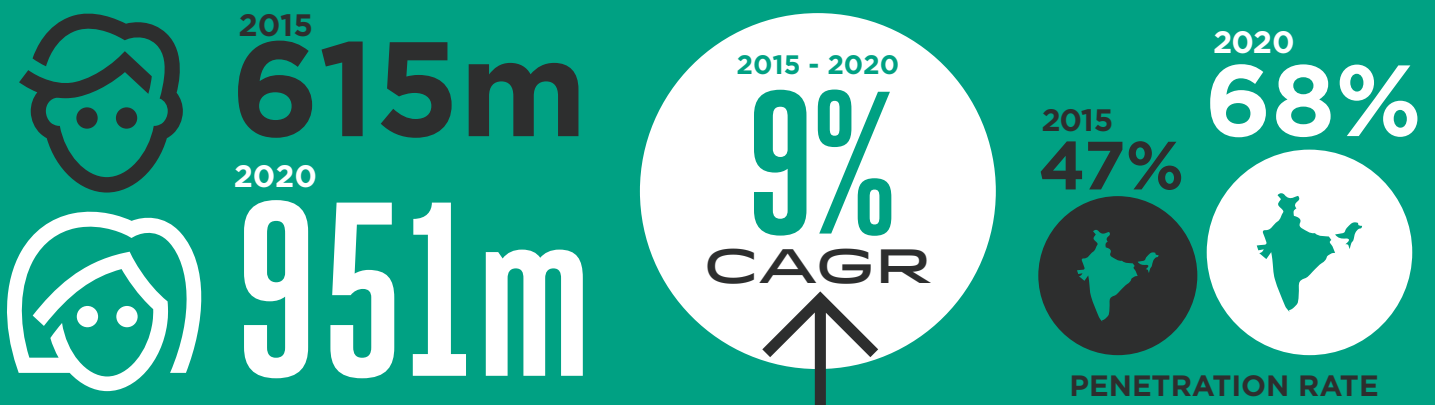
Policy and regulatory reform can help boost mobile broadband

Review and reform in three key areas would accelerate mobile broadband access and adoption across the country:

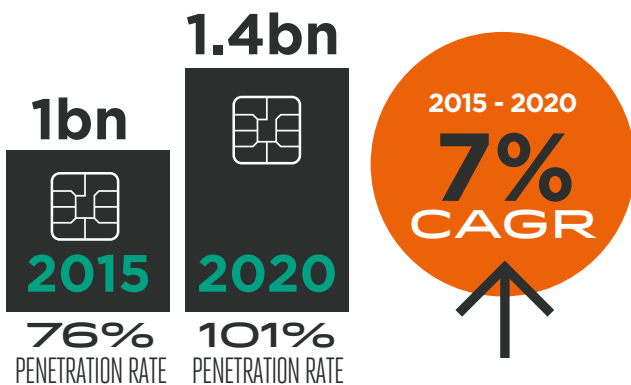
- India will benefit by adapting regulation to the realities of the new digital ecosystem. Obligations tied to a specific technology, rather than the service provided, distort the market, preventing operators from competing equally with other digital market players.
- Mobile operators in India carry significant debt as a result of the high prices for spectrum, administrative fees and levies. Reductions of these costs would free resources and foster an atmosphere conducive to investment, which is needed to keep pace with network expansion and improvements to achieve the goals of Digital India.
- To cater for rising mobile broadband adoption, India should commit to the spectrum bands supported at WRC-15. More importantly, India needs to allocate the 470–698 MHz band for IMT in order to boost mobile broadband and the broader digital economy.

MOBILE ECONOMY INDIA

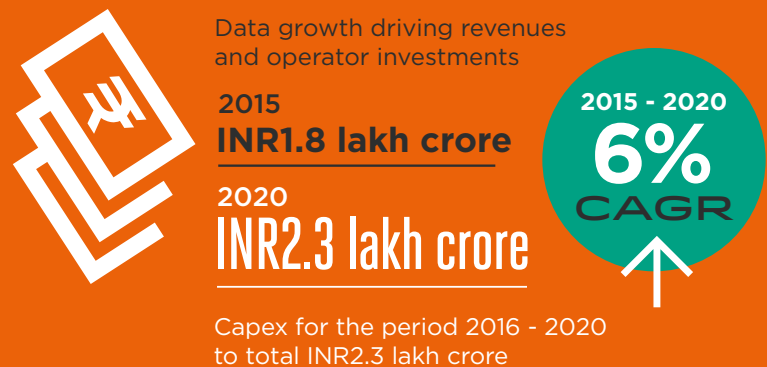
Unique subscribers



SIM connections Excluding M2M

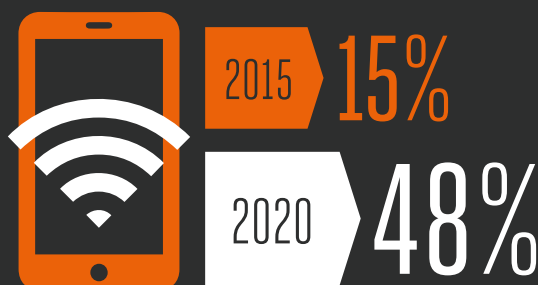


Operator recurring revenues



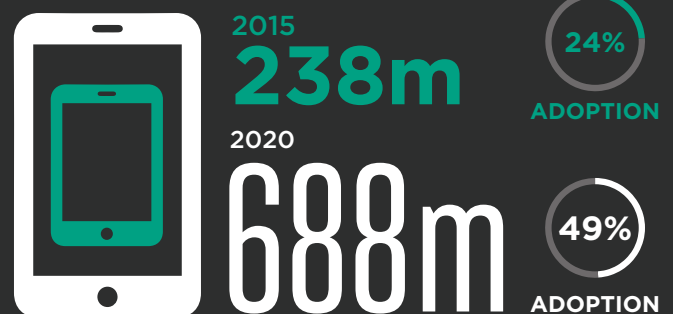
Accelerating moves to mobile broadband and smartphone adoption

MOBILE BROADBAND CONNECTIONS



Data traffic to grow by a CAGR of 63% over the period 2015 - 2020

SMARTPHONES



India is now the world's second largest smartphone market

Mobile contributing to economics and social development in India



Delivering digital inclusion to the still unconnected populations
Mobile internet penetration
2015: 30%
2020: 48%



Delivering financial inclusion to the unbanked populations
14 live services in India as of **June 2016**



Delivering innovative new services and apps
Number of M2M connections to reach **25m** by **2020**

Mobile industry contribution to GDP



2015

INR9 lakh crore

2015
6.5% GDP

2020

INR14 lakh crore



Public funding

Mobile ecosystem contribution to public funding before spectrum proceeds



2015
INR105,000 crore

2020
INR145,000 crore

Employment

2015

2.2m JOBS

2020

3m JOBS



Plus an additional **2M** indirect jobs by 2020

1 India mobile market overview

1.1 India to add 337 million mobile subscribers by 2020

The mobile industry in India has grown rapidly over the last five years. At the end of June 2016, 616 million unique users subscribed to mobile services, with India the second largest mobile market in the world. Almost half of the country's population now subscribe to a mobile service, indicating the significant growth potential in the coming years, particularly from the rural and under-penetrated segments. Improving affordability, falling device prices and better network coverage aided by operator investments, together with positive policy support and healthy macro-economic conditions, will help deliver over 330 million new unique subscribers by 2020.¹

India accounts for more than a quarter of mobile connections in Asia Pacific, amounting to over 1 billion as at the end of June 2016. Over 400 million SIM connections are expected to be added by 2020, bringing the connections penetration to just over 100%.

1. These latest unique mobile subscriber statistics are based on the results of an extensive global consumer survey conducted by GSMA Intelligence in 2015

1.2 Technology shift to high-speed broadband accelerates as 4G arrives

India is seeing an ongoing technology shift to mobile broadband services, with a gradual reduction in data tariffs and growing availability of a wide selection of affordable smartphones for consumers. Mobile broadband adoption is forecast to grow more than four-fold by 2020. Operators are investing to improve network coverage, with 3G set to reach 90% of the population by 2020, and 4G coverage to increase 14-fold to reach 70% of the population by the same date.

4G has seen sluggish growth in India since its initial launch in 2012, hindered in part by the lack of affordable, harmonised spectrum in the sub-1 GHz coverage bands. The recent commercial launch of services by Reliance Jio and investments by the

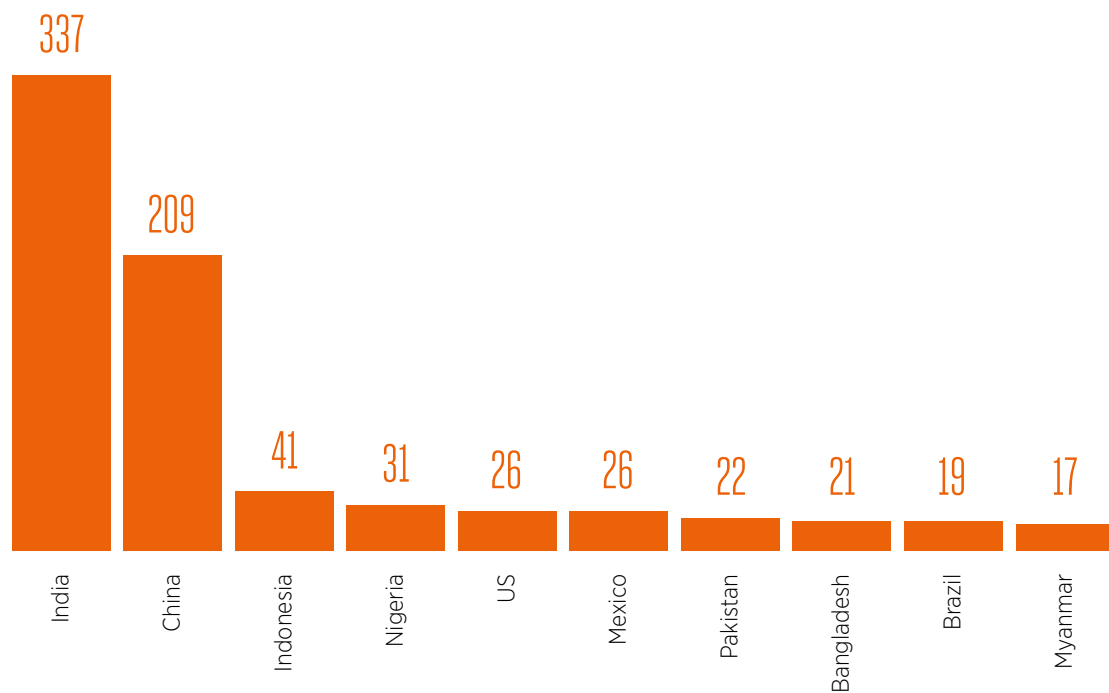
existing operators to expand their 4G services will drive rapid growth in 4G connections. The 4G connection base is forecast to grow from just 3 million at the end of 2015 to 280 million by 2020. Mobile broadband (3G and 4G) will account for just under 50% of total connections in India by then.

However, this will still leave India lagging behind the Asia Pacific region in terms of mobile broadband adoption, with the regional average set to total over 70% of total connections by 2020. A key driver of broadband uptake, and particularly 4G, will be the timely release of affordable spectrum to meet rapidly growing demand.

Figure 1

Unique mobile subscriber additions

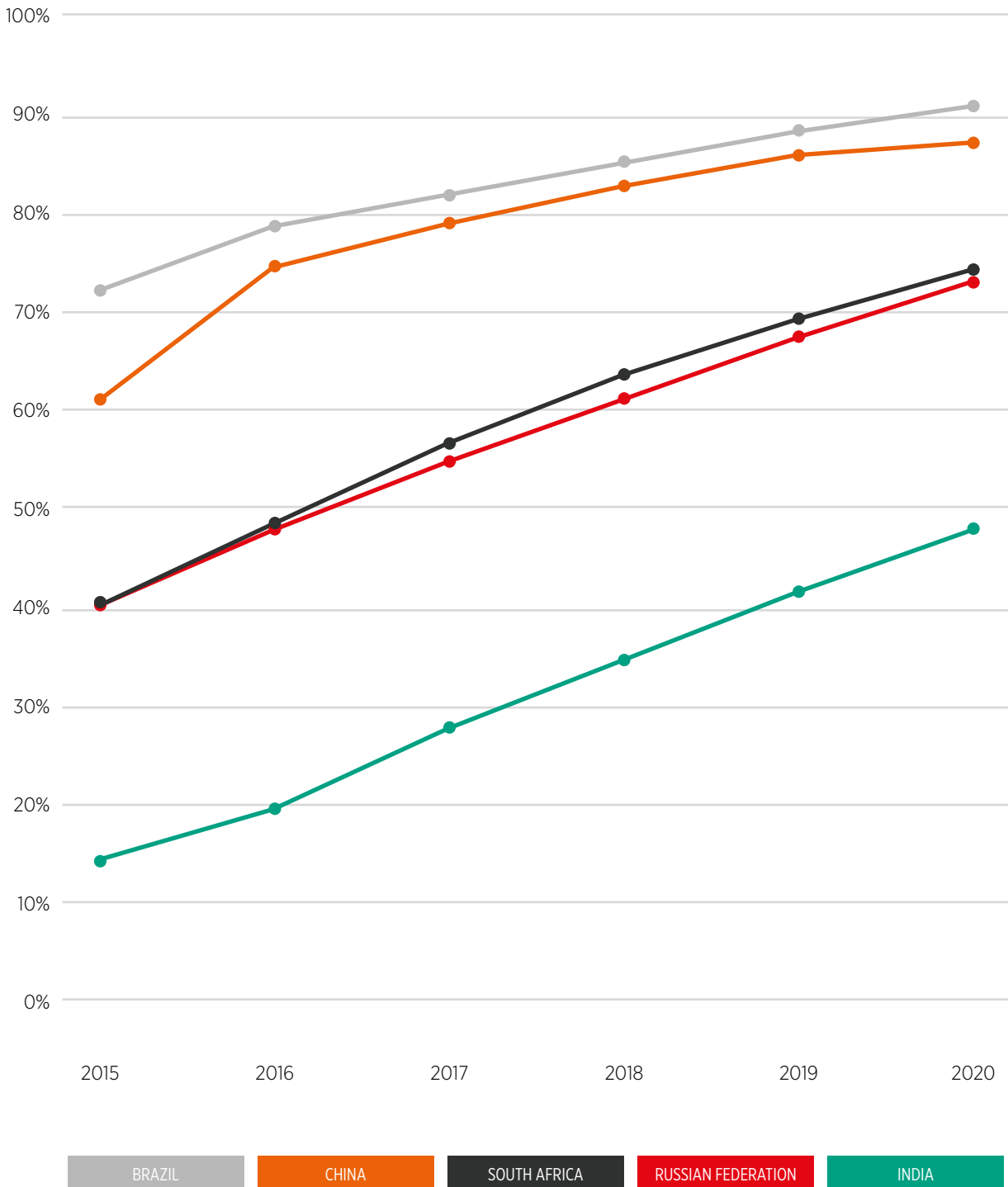
Millions, 2015-2020



Source: GSMA Intelligence

Figure 2

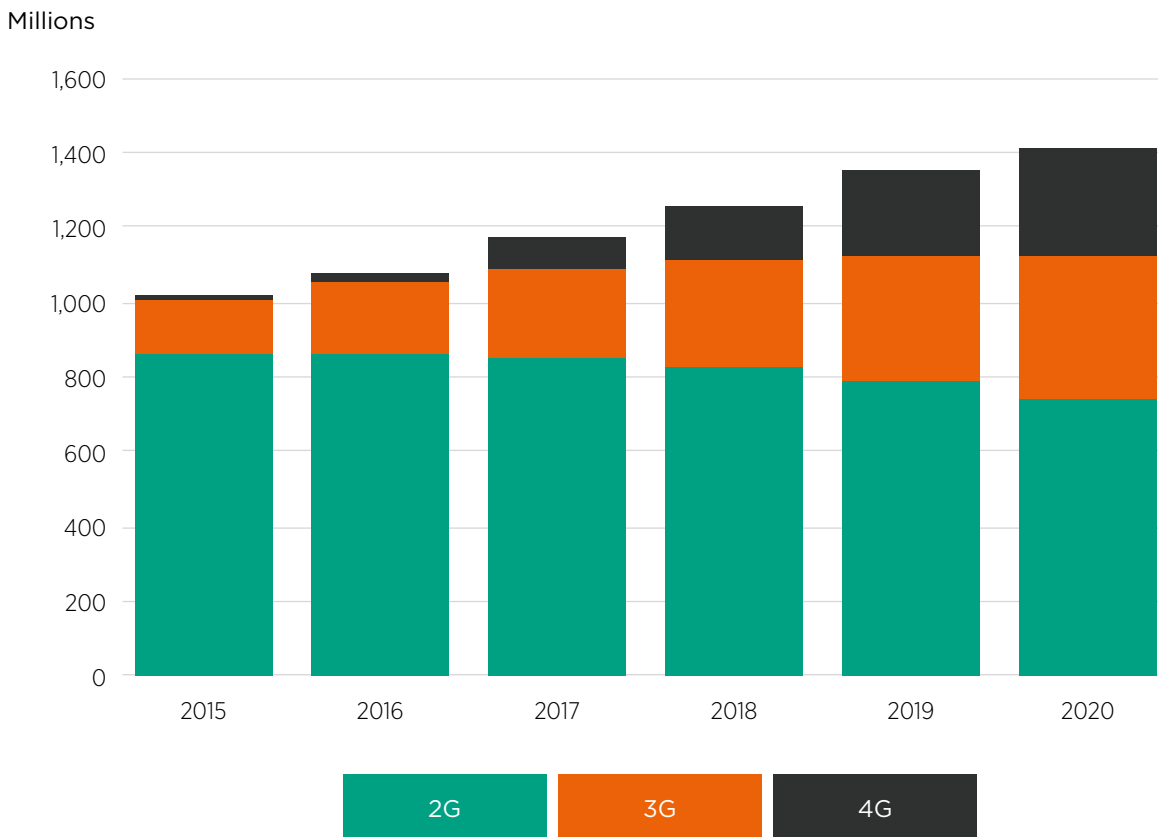
Mobile broadband adoption



Source: GSMA Intelligence

Figure 3

Connections by technology in India



Source: GSMA Intelligence

1.3 'Make in India' programme supports local manufacturers driving smartphone adoption

India is now the world's second largest smartphone market, overtaking the US in the first half of 2016. As the 'Make in India' campaign gathers pace, more than 25 vendors are now manufacturing cheaper smartphones locally in India. Over two-thirds of the smartphones shipped in the first quarter of 2016 were assembled within the country.² Many global majors are also eyeing the significant opportunity that 4G adoption will create in the market.

India will be the main driver of smartphone growth in Asia Pacific over the next few years, adding close to half a billion new smartphone connections by the end of 2020. This will take the adoption rate in India to around half of total connections, highlighting the scope for smartphone sales in the future as devices and data services become more affordable, digital literacy improves and more locally relevant content is made available.

2. Source: CyberMedia Research

1.4 Data consumption grows as social networking and online services gain popularity

Mobile data traffic in India increased 89% between 2014 and 2015, with Indians consuming around 150 PB of mobile data per month in 2015³ (for context, this is the equivalent of 37 million DVDs each month). As more users migrate to high-speed broadband, mobile data traffic is expected to grow 12-fold between 2015 and 2020, a CAGR of 63%. This is ahead of growth in the Asia Pacific region overall, forecast at a CAGR of 54%.

The increasing popularity of social networking and online communication services has been

instrumental in this. Surveys show that nearly 80% of adult respondents aged between 18 and 54 claim to now use online communication apps (such as WhatsApp and Line) more frequently than traditional text messages (SMS).⁴ Increasing use of online messaging services and the consumption of other online content means the contribution of data to mobile revenues is now increasing. However, voice services will continue to contribute more than three-quarters of recurring revenues for the top three operators.

Figure 4

Mobile data traffic data per month in India



Source: Cisco VNI Forecasts

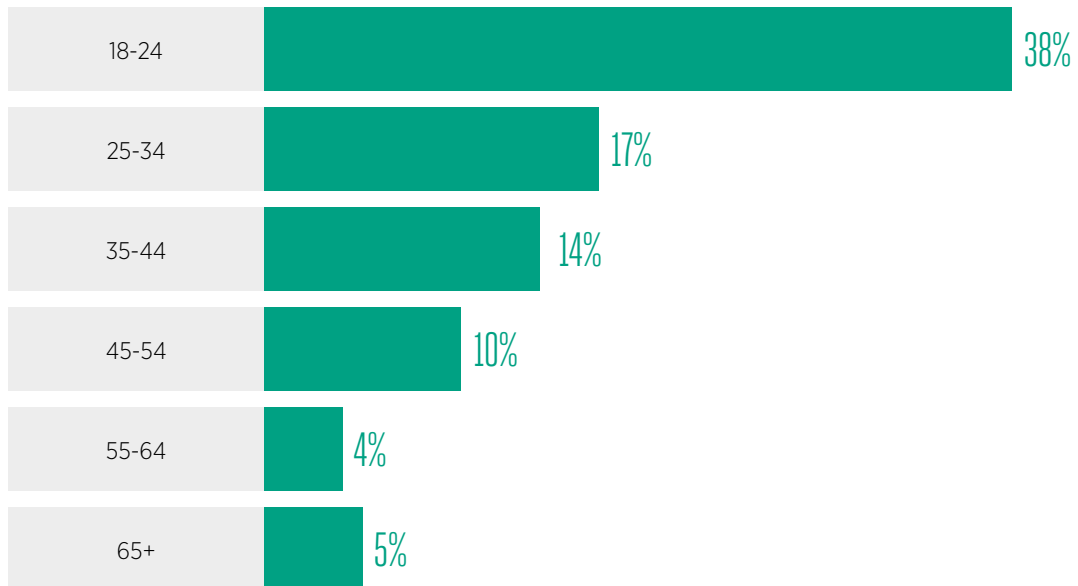
3. According to Cisco VNI forecasts for 2015-2020

4. According to GSMA Intelligence Consumer Survey 2015

Figure 5

Nearly 8 in 10 respondents below the age of 55 use IP messaging services more than text

Percentage claiming to use IP messaging services more frequently than SMS



Source: GSMA Intelligence Consumer Survey 2015



1.5 Operator financials show signs of recovery but deeper problems persist

India remains one of the most competitive mobile markets in the world as measured by the Herfindahl-Hirschman Index, though there are growing expectations of moves to consolidate in the market in the coming quarters. The last few years have seen some recovery in financial performance for the sector overall, with EBITDA margins up by around 14 percentage points over the four-year period to 2015. However, the Indian market's overall EBITDA margin of 33% in 2015, while converging more towards the regional average, still lags behind regional peers such as China, Bangladesh and Pakistan.

The headline figures hide the reality that the Indian mobile market remains a two-tier market, with the larger players continuing to seek scale and build long-term viability while many of the smaller players continue to struggle. Challenges for the market include low or even negative margins, high debt levels, and in some cases controlling shareholders that are looking to exit.

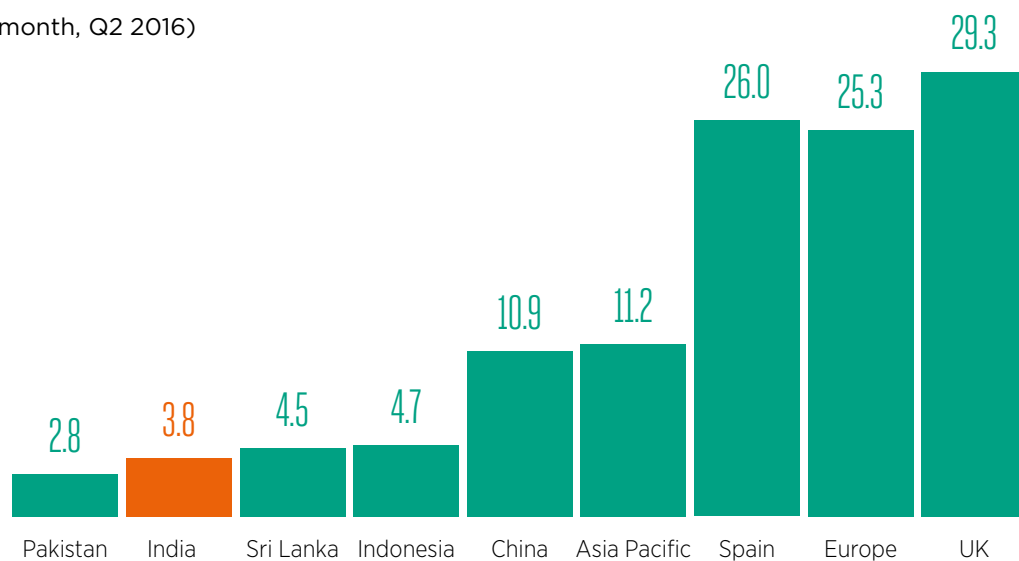
Mobile revenue growth is expected to show modest declines over the next few years, with service revenue growth for the period to 2020 forecast at a CAGR of 6%. Although this represents a clear slowdown from growth in the first half of the decade, operators are increasingly trying to offset the impact of competition and slowing subscriber growth with monetisation of the growth in data traffic.

Voice prices appear to have largely bottomed out in India, although the effective price per minute is still among the lowest in the region (\$0.01 compared to a regional average of \$0.02). Reliance Jio's market entry is likely to see increased pricing pressure in the data market; a number of the established operators have already reduced data pricing. India has one of the lowest ARPU per subscriber levels (\$3.8 per month) in Asia Pacific.

Figure 6

ARPU per subscriber

(\$ per month, Q2 2016)

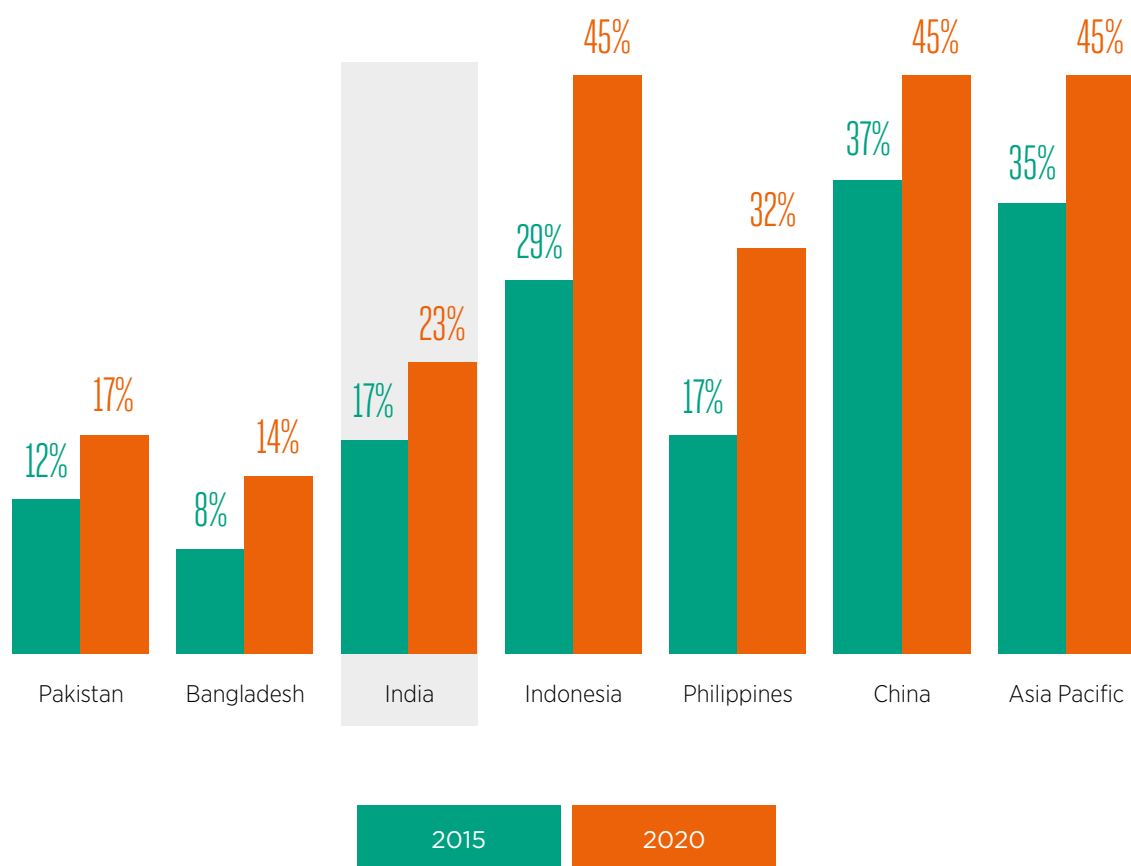


Note: Revenue per subscriber = recurring revenues divided by average number of unique subscribers per month
Source: GSMA Intelligence

Although the uptake of smartphones and the belated migration to 4G networks have created a good opportunity for data revenue growth, mobile operators in India have so far reported limited revenue contribution from data services. Data revenues currently represent a relatively small proportion of service revenues, around 17% at the end of 2015 (forecast to increase to 23% by 2020) and well below advanced countries in Asia Pacific at 30–35%. Policymakers therefore need to take into account local market forces, balancing the need for government revenue with setting spectrum auction prices that are affordable for the telecoms sector.

Figure 7

Data as a share of recurring revenues



Source: GSMA Intelligence

Operators have made capex investments worth INR154,100 crore over the last five years, a figure that is forecast to increase sharply to total around INR227,800 crore for the period to 2020. India remains a highly capital-intensive market, reflecting in part heavy spectrum reserve prices. Operating cashflow margins stood at just over 12% in 2015, around three percentage points below the regional average and six below the global average. Although cash flow margins are expected to increase across the rest of the region, competitive pressures and network investments mean margins in India will remain subdued. This highlights the need for operators to move to more sustainable business models through consolidation if they are to justify the high levels of investment required to support ongoing mobile broadband network expansion.

2 Economic contribution of the mobile industry

In 2015, the mobile industry was responsible for a total of 6.5% of India's GDP, a contribution that amounts to more than INR9 lakh crore of economic value added. The figure accounts for both the direct economic activity generated by mobile operators and the ecosystem of mobile industries in India, and broader knock-on effects on the rest of the economy, including the indirect impact on the broader economy and the productivity boost from the use of mobile technology by individuals and firms.

Mobile operators and the ecosystem provided direct employment to approximately 2.2 million people in India across both the organised and unorganised sectors. Further to the employment that is directly sustained within the ecosystem, additional jobs were indirectly supported in other industries, as the ecosystem generated demand and jobs in other sectors that benefit from the activity of the mobile industry, particularly in the direct supply chain. In 2015 approximately 1.8 million jobs were supported in this way, bringing the total impact (both direct and indirect) of the mobile industry to nearly 4 million jobs in 2015.

The mobile ecosystem also makes a highly significant contribution to the funding of the Indian public sector, with approximately INR1.4 lakh crore in 2015. This contribution comprised INR67,000 crore in general taxation, INR38,000 crore in mobile-specific taxation⁵, and payments of approximately INR34,000 crore for the licencing of spectrum acquired as a result of the multi-band spectrum auctions in March 2015 (800 MHz, 900 MHz, 1800 MHz and 2100 MHz).⁶

5. Regulatory fees in the form of the universal service obligation, licence fees and spectrum fees.

6. The figure attributed to 2015 is only a fraction of the overall figure and reflects the actual cash down-payment required from Indian operators in 2015, with the remainder of the total cost required in subsequent years.



Figure 8

Total (direct, indirect and productivity) contribution to GDP

INR lakh crore, % 2015 GDP

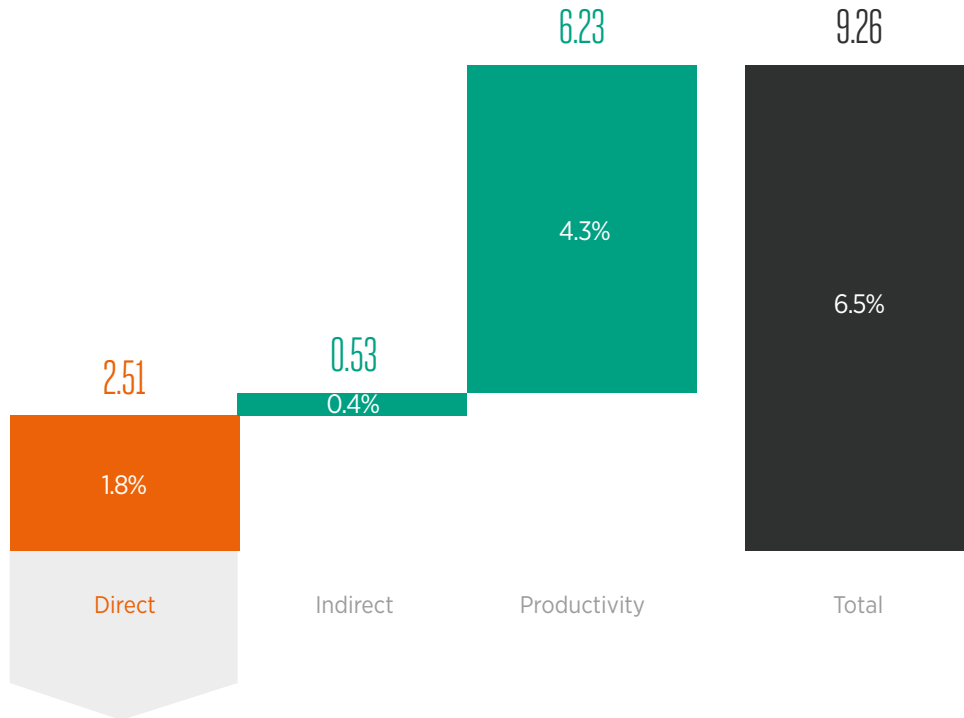
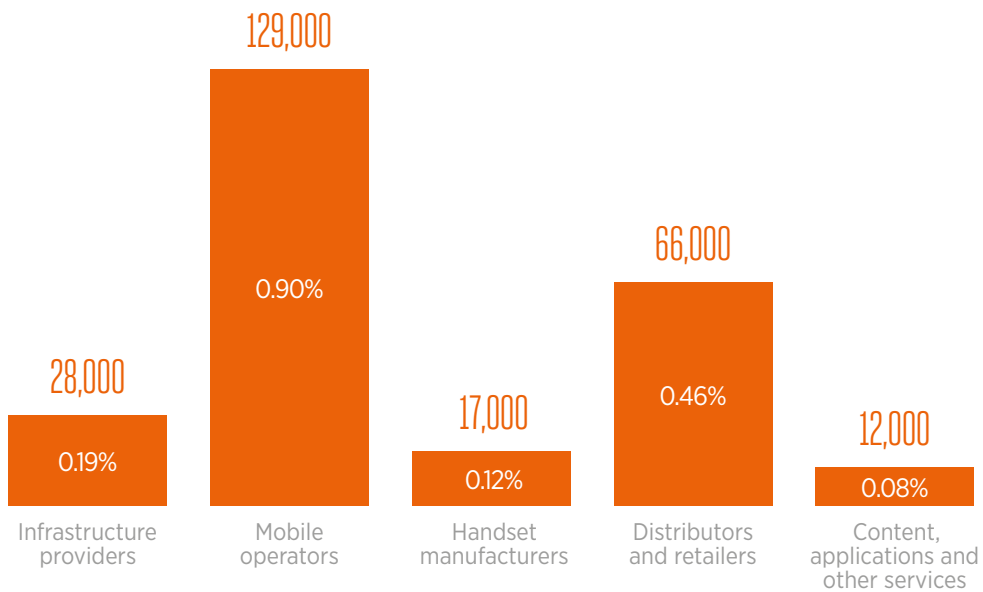


Figure 9

Direct GDP contribution of the mobile ecosystem

INR crore, % 2015 GDP



Source: GSMA Intelligence

Figure 10

Total employment impact of the mobile industry

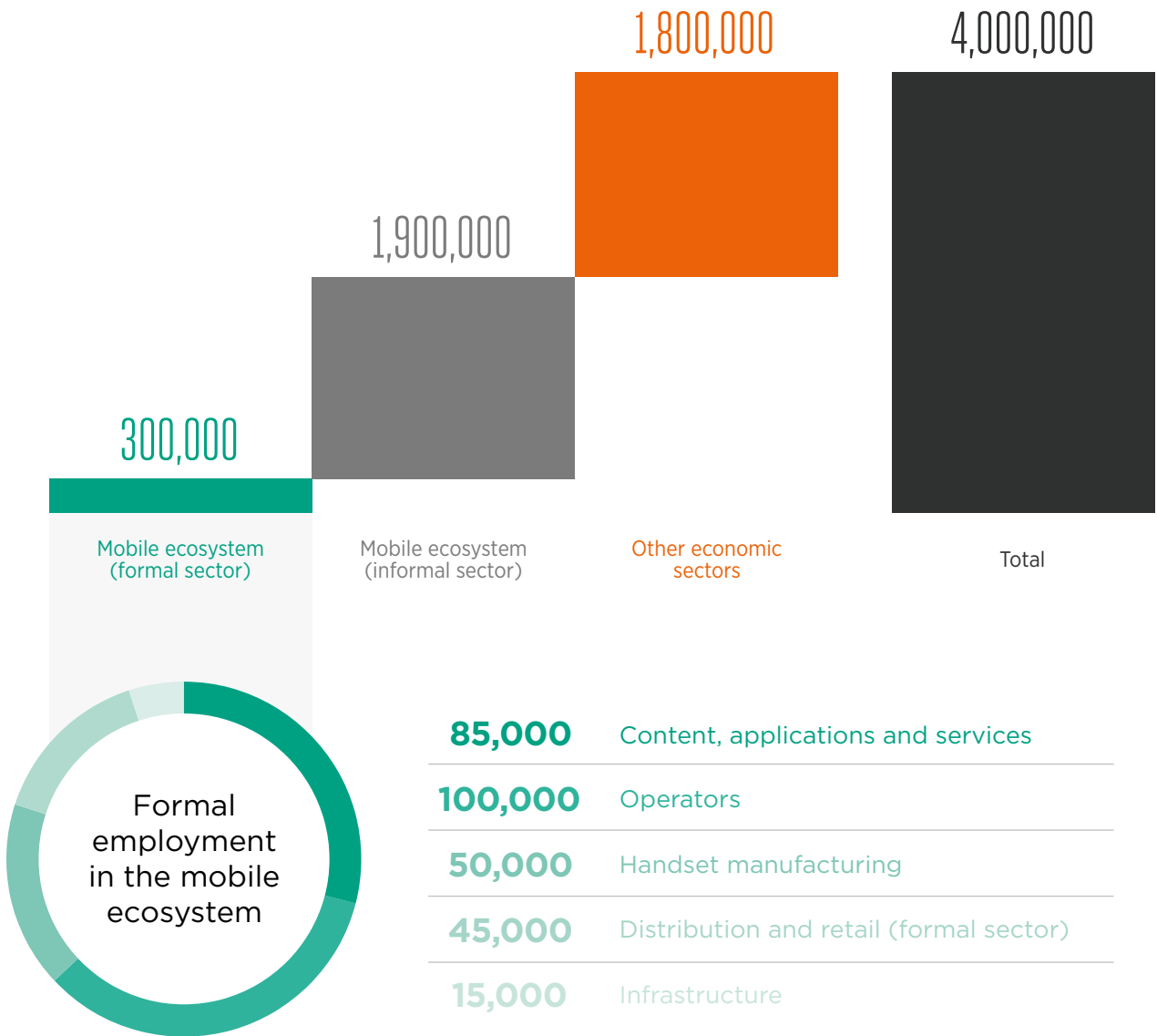
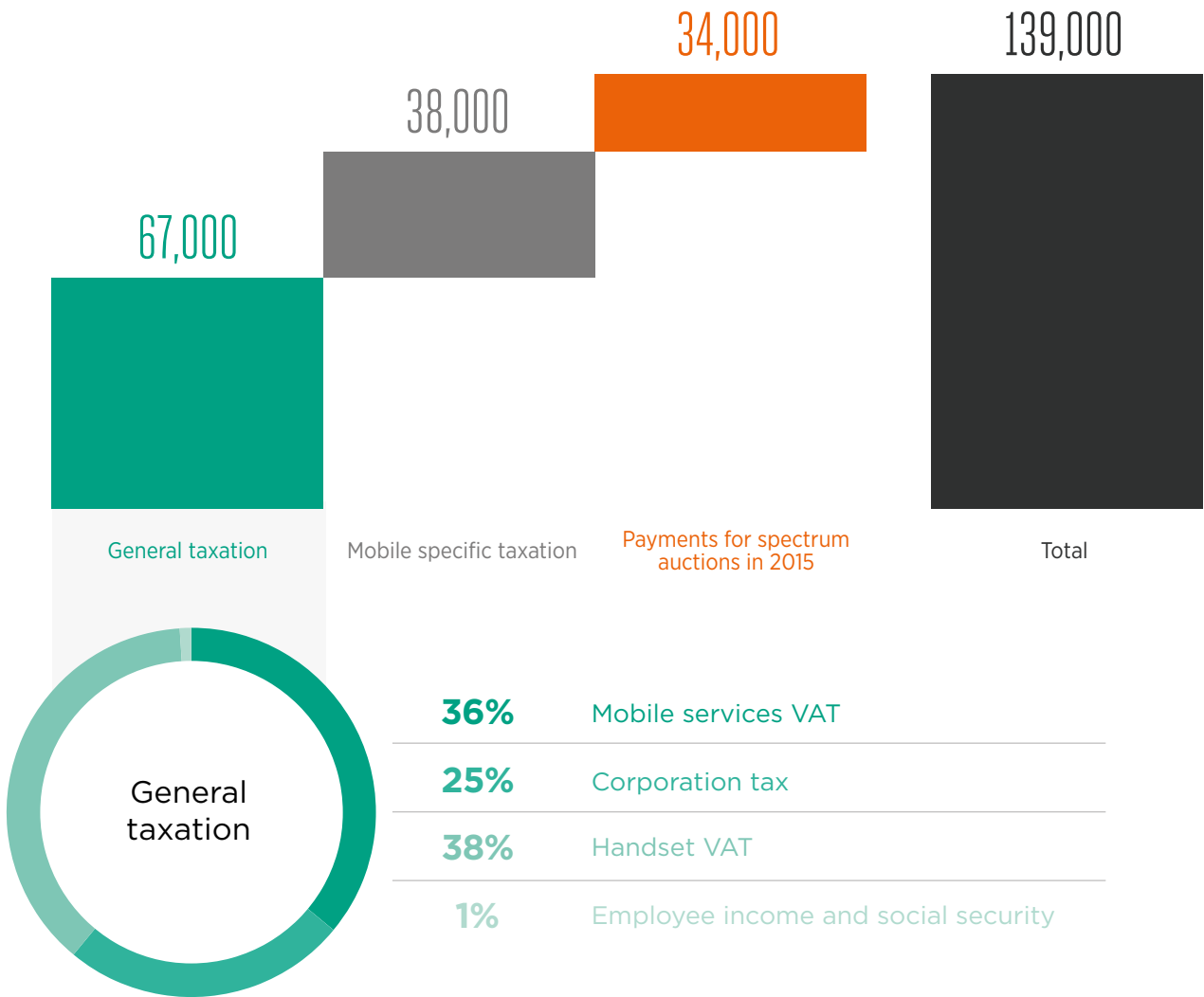




Figure 11

Total contribution to the funding of Indian public sector, mobile ecosystem

INR crore, 2015



Source: GSMA Intelligence

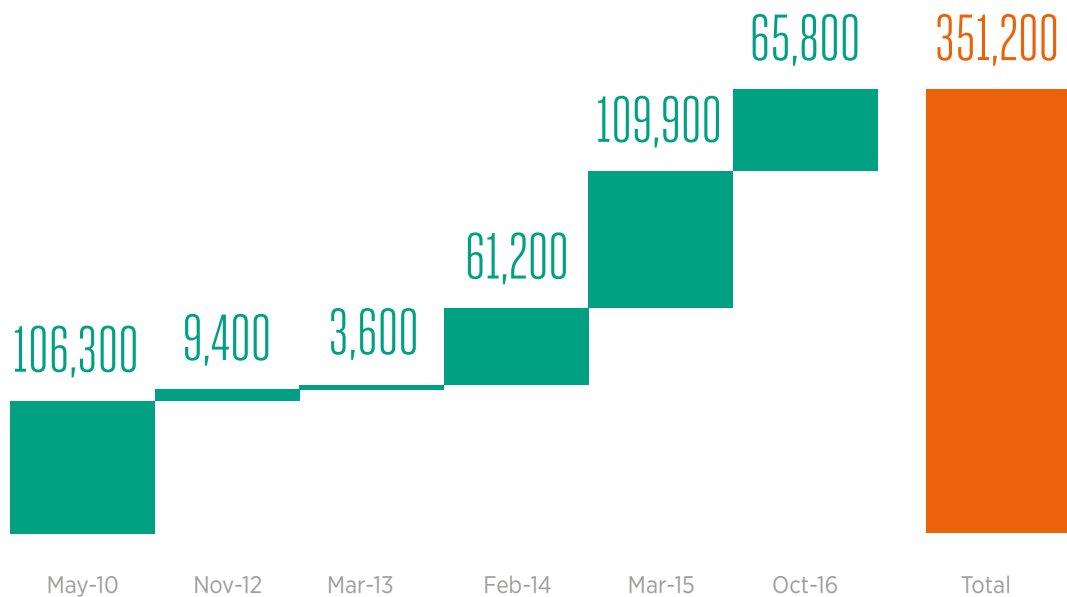
Note: Mobile-specific taxation includes regulatory fees in the form of the universal service obligation, licence fees and spectrum usage charges. The figure attributed to payments for spectrum is only a fraction of the overall cost of spectrum acquired in 2015, and reflects the actual cash down-payment required from Indian operators in 2015, with the remainder of the total cost being required in subsequent years

Between 2010 and 2016 the Indian government raised a total of over INR350,000 crore across six different spectrum auctions. The high cost of spectrum in India affects the ability of operators to fund network investments.

Figure 12

Total amount raised through spectrum auctions

INR crore



Source: GSMA Intelligence

In the period to 2020, growth will be experienced across the key economic impact measures of the mobile industry in India: its value added, employment, and its contribution to the funding of the public sector.

In value added terms, we estimate that a total economic value of INR14 lakh crore will have been generated by 2020 in the form of salaries, profits and tax payments, up from a figure of INR9 lakh crore in 2015. The total number of jobs directly supported by the ecosystem will also grow significantly in the period to 2020 to approximately 3 million, with an additional 2 million indirect

jobs also supported by 2020. The public funding contribution of the mobile ecosystem in the form of general and mobile specific taxes will reach INR145,000 crore by 2020 in real terms if tax rates and regulatory fees rates remain at current levels. This figure is an underestimate of the future total contribution of the mobile ecosystem to the funding of the Indian public sector, since it does not include the proportional part of payments due from the 2014 and 2015 spectrum auctions, as well as all the proceeds from the recent 2016 auction.

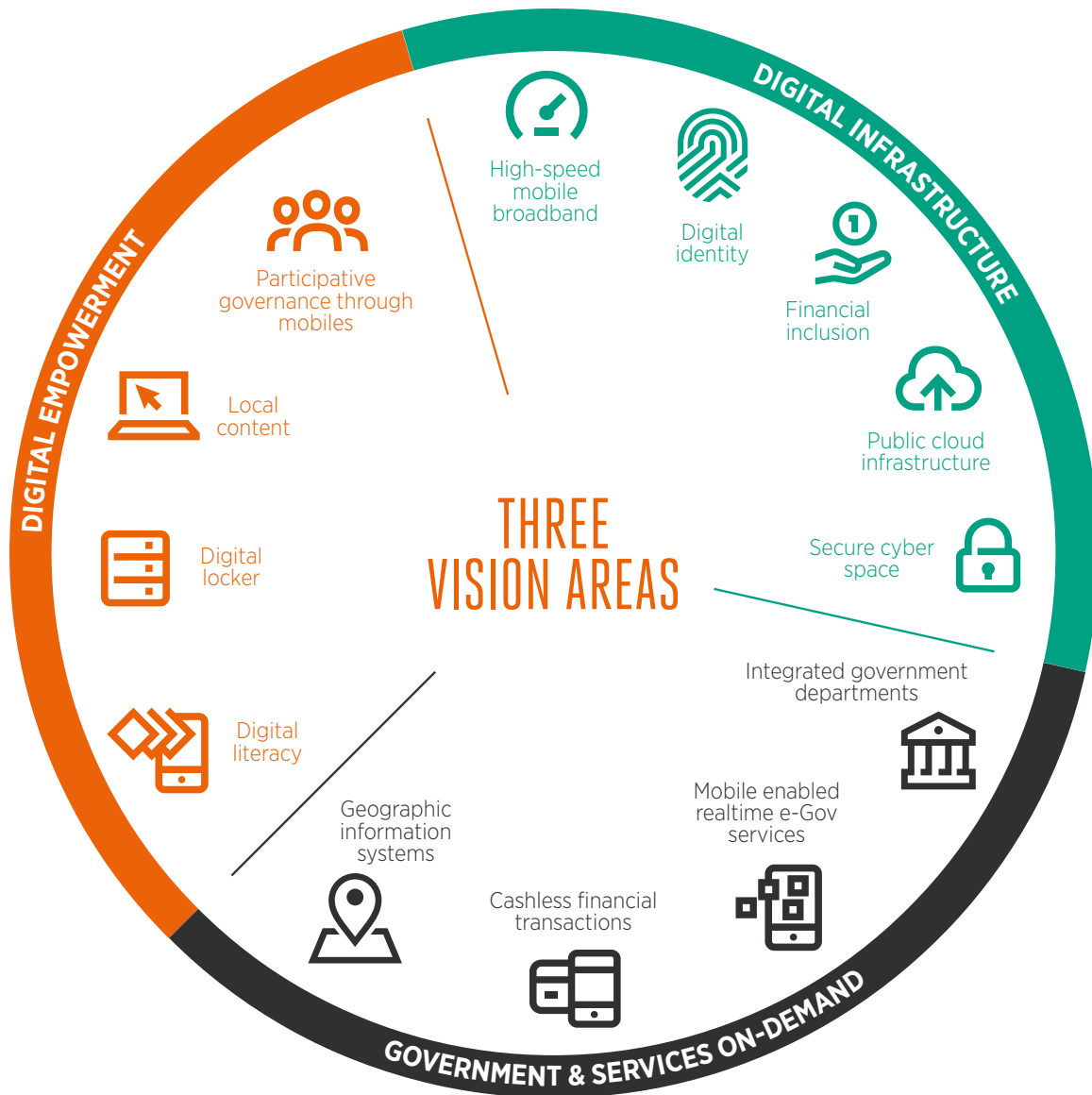
3 Digital India: delivered through mobile broadband

The Indian government's Digital India initiative was launched in 2015 and aims to utilise the potential of digital technologies to address some of the significant socioeconomic challenges in the country. The initiative looks to empower 1 billion subscribers by providing internet access to all.

Digital India has three key focus areas and nine pillars. Digital India will be delivered over mobile broadband, given the lack of alternative (fixed line) infrastructure, high levels of mobile ownership in the country and ongoing significant investment by operators to further build out networks and bring affordable services to the country's population.

Figure 13

Building Digital India through mobile



Source: GSMA Intelligence

The Indian government recognises the potential of the mobile sector in advancing financial access, improving information, and raising productivity in the economy. There are efforts to address the digital divide by extending inclusive internet access to every Indian, as mobile technology looks to empower the masses and become the critical means of accessing a broad range of public services. Mobile is also addressing a range of social challenges in the country, including digital inclusion and the problems of unregistered populations.



3.1

Mobile delivering digital inclusion

Mobile is already the main platform for internet access in India and brought connectivity to many previously unconnected populations. Digital inclusion can extend various economic and social benefits to previously unconnected populations, fuelling a virtuous circle that reduces poverty, improves infrastructure and services, and further increases internet access and usage.

- As of mid-2016, there were around 430 million individuals with mobile internet access, a figure that will increase to almost 670 million by 2020.
- By 2020, almost half of the population in India will have mobile internet access, up from around a third of the population as of mid-2016.
- This will still leave India trailing the regional average of 63% penetration and well behind markets such as China where mobile internet penetration will be approaching 80% of the population.
- A survey by GSMA Intelligence identified the lack of awareness and locally relevant content as the biggest barrier to internet usage (80% of respondents).

Digital Inclusion: The Mobile internet Skills Training Toolkit

The GSMA's Connected Society programme created the Mobile Internet Skills Training Toolkit (MISTT),⁷ developed for mobile operators, NGOs, development organisations and governments that want to provide training to improve people's basic knowledge and understanding of the mobile internet. It provides an introduction to using the mobile internet on an Android entry-level smartphone through three services: WhatsApp, YouTube and Google, with information about safety and cost included throughout.

The GSMA partnered with the research agency 2CV Ltd, mobile operators in India (Telenor India and Idea Cellular) along with the NGO, Digital Empowerment Foundation, to develop, test and produce the MISTT. The toolkit was tested in Maharashtra State, India, and the GSMA is confident that it will have relevance throughout the rest of the country. The GSMA has created English and Hindi versions of the MISTT and encourages language customisation and localisation across markets at the local level using the accompanying How To Guide.

Idea's Internet For All initiative

This campaign launched by Idea Cellular in June 2016 is aimed at connecting all Indians to the internet. Idea introduced a new platform 'Internet for All', aimed at educating non-users about the possibilities of the internet and its power to transform lives. The platform enables 45 million existing Idea internet users and over 1.5 million retailers to give one month of free internet access to friends and family members who are not currently using the internet. On conversion of a non-user to a user, the data user also gets free data from Idea, as a token of appreciation. Within the first 45 days of the service being launched, Idea recorded more than 8.3 million hits on the portal, with free data credit given to nearly 2 million non-users.

Idea also created an 'Easy Share' platform to enable mobile internet users to share data with those in need.

7. See: www.gsma.com/mobilefordevelopment/programmes/connected-society/mistt



3.2

Mobile delivering financial inclusion

Financial inclusion is growing in India. Around 65%⁸ of Indian adults have an account with a financial institution, and there is significant room to leverage mobile technology to increase use of financial services. The recent introduction of payment bank regulations has created a more supportive regulatory environment and opened the door for several non-banks to take on a differentiated

banking licence to offer payments services. An initial 11 licences were awarded, and four of the eight remaining licence holders are led by mobile operators. The opportunity to contribute to financial inclusion is huge, but operators will need to combat the low levels of mobile money awareness (10%) and usage (0.5%).⁹

Financial inclusion: new licences held by mobile operators

Four of the eight remaining licensees for the new payment banks in India are operator led (Vodafone, Airtel, Reliance Jio and Idea Cellular).

- More than 620 million mobile connections and growing – the combined customer base of these four telcos, demonstrating their potential to add to financial inclusion.
- More than 5 million physical distribution points can be transformed to provide financial access to customers.
- The GSMA is partnering with operators to consider new directions and business cases for mobile money under the new payment banks regulatory regime.

8. Source: Financial Inclusion Insights
9. Source: Financial Inclusion Insights



3.3

Mobile delivering digital identity

The World Bank estimates that 1.5 billion people, or 20% of the world's population, lack an official ID. Without proof of identity, citizens cannot access certain essential services, assert rights or fully participate in the digital and analogue worlds. Birth registration is a fundamental stepping stone in ensuring the provision of an official identity. UNICEF reported that nearly 60% of births in India are unregistered.

The Indian government launched the Aadhar project in 2010 to authenticate the identity of citizens through a unique identification number. As of the end of July 2016, more than 1 billion identification numbers had been issued through the project.¹⁰ Mobile operators can play an important role in supporting the government's digital identity efforts. One solution is the GSMA-backed authentication solution, Mobile Connect.



GSMA's Mobile Connect in India

In July 2016, the GSMA's Mobile Connect mobile-based authentication solution was launched to more than 800 million consumers across India. The mobile network operators offering Mobile Connect services are Aircel, Bharti Airtel, Idea, Tata Teleservices Ltd, Telenor and Vodafone.

The Indian operators' launch of Mobile Connect adds to the global momentum behind the solution; today, 42 operators in 22 countries around the world are implementing Mobile Connect, making it available to nearly 3 billion customers. The solution enables customers to create and manage a universal digital identity via a single login by employing the user's unique mobile number combined with a unique PIN. The service simply and securely authenticates users, enabling them to digitally confirm their identity and their credentials and gain safe online access to mobile and digital services.

In addition to the operators' websites, the GSMA has launched a portal (www.mobileconnect.in) where Indian consumers can find further information and tutorials on Mobile Connect.

10. Source: Unique Identification Authority of India

3.4 UN Sustainable Development Goals and mobile operator initiatives

Countries across the developing world face a range of social and developmental challenges. Rapid population growth and youthful populations create challenges in providing access to basic infrastructure and services – challenges clearly evident in India. In September 2015, the UN introduced the Sustainable Development Goals – a 17-point plan to end poverty,

combat climate change and fight injustice and inequality. Mobile networks have the power to accelerate this journey in a way no other technology can. The GSMA and mobile operators are united in helping tackle the Sustainable Development Goals and ensuring that connectivity plays a key role in helping achieve the 17 targets by 2030.¹¹

2
ZERO
HUNGER



AGRICULTURE

End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

Agriculture is the main contributor to GDP in emerging markets and the largest employer. Mobile operators provide nutritional information to improve the health of people in emerging markets. They are also leading the delivery of critical information that improves the crop yields and incomes of smallholder farmers.

CASE STUDIES

India is the biggest mAgri market globally, with four service providers delivering agricultural value-added services (VASs) to more than 500,000 users each. Two providers (RML and Green SIM) have surpassed 1 million. The GSMA estimates there could be 45 million potential agricultural VAS users in India by 2020.

Kisan Mitra, Vodafone India

Launched in May 2015, Vodafone India's Kisan Mitra (Farmer's Club) now has a base of 500,000 users. The service offers agricultural information and news, market prices and localised weather forecasts via SMS. The service, which is available in nine languages, allows farmers to receive three to six SMS alerts per day. A Vodafone study released in May 2015 claims simple mobile service interventions can increase a farmer's income by \$128 per year for over 60% of Indian farmers by 2020.¹²

11. See <http://www.gsma.com/betterfuture/>

12. Source: Connected Farming in India, Vodafone, May 2015

3 GOOD HEALTH AND WELL-BEING**HEALTH**

Ensure healthy lives and promote wellbeing for all at all ages.

More than 1,200 mobile health initiatives have been deployed to date; mobile is having a profound impact on the healthcare industry. Mobile networks enable the delivery of mobile health to people and places previously unreachable, providing healthcare to those who need it most.

CASE STUDIES**IAP HealthPhone project**

The IAP HealthPhone project is a national initiative under the aegis of Indian Academy of Pediatrics (IAP) in partnership with the India government and the United Nations Children Fund (UNICEF). IAP HealthPhone is distributing four Poshan videos available in 12 Indian languages. The first phase of the project is supported by Vodafone India, which will promote the videos through mobile phones to its customer base of 180 million. Vodafone will waive data charges for downloads and offer an incentive of 10 rupees for watching all the videos. It is expected that the online platform will reach more than 8 million women by 2018, with more operators set to join the initiative and extend its impact.

4 QUALITY EDUCATION**EDUCATION**

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Mobile operators are working to support students and teachers in integrating mobile technologies into the classroom. Mobile also enables access to greater learning opportunities for youth in urban hubs and remote locations.

CASE STUDIES**WebWise – Safe Internet for Children**

Telenor India has developed a school outreach programme – WebWise – aimed at creating awareness of Internet safety among children and helping parents to monitor and educate their children about internet safety.

The programme was started in February 2014 with Telenor employee volunteers reaching out to schools and parents to run internet safety workshops for children. In the first year, more than 45,000 students were trained on developing safe internet habits.

5 GENDER EQUALITY

**WOMEN EMPOWERMENT**

Achieve gender equality and empower all women and girls.

200 million fewer women than men own mobile phones in low- and middle-income countries. The mobile industry is working to close this gender gap and deliver socioeconomic benefits to women, such as increased access to financial, health, education and employment services and opportunities.

CASE STUDIES

A study by the GSMA Connected Women programme highlighted a significant gender gap in mobile in India. Women are 36% less likely to own a mobile phone than men, which translates to approximately 114 million women in India.¹³ In response, several Indian operators have already made formal commitments to increase the proportion of women in their mobile internet and/or mobile money customer base by 2020.

Project Sampark, Telenor India

Telenor India developed and launched Project Sampark (Communication) to bridge the gender gap in rural India in August 2014. The project involves a pack of two paired SIMs (topping up either SIM accrues benefits to the second), one of which is to be used by a woman and the other by the male household member.

The project was piloted in the Aligarh district of Uttar Pradesh West and has seen both social and commercial impact. Within 24 months of launch, Telenor has achieved more than 75,000 new subscribers through this project, of which 50% are women. Following its success in Aligarh, the programme has been extended to another three zones.

6 CLEAN WATER AND SANITATION

**WATER**

Ensure availability and sustainable management of water and sanitation for all.

Some 262 million people without access to an improved drinking water source live in areas covered by mobile networks. Mobile networks and services can improve the efficiency of current water and sanitation services and extend their reach.

CASE STUDIES

NextDrop

In January 2014, NextDrop was awarded a £141,250 seed grant by the GSMA to deploy its innovative service to 40% of Bangalore (8 million residents) in association with the Bangalore Water Supply and Sewerage Board (BWSSB).

NextDrop's solution not only stabilised supply time in 14% of valve areas but also led to a 90% reduction in complaints at BWSSB's call centres. To reduce customer complaints, simple process improvements were made, such as providing customer call centre operatives with the scheduled supply time, reflecting the importance customers attach to water-related information.

13. Bridging the gender gap: Mobile access and usage in low- and middle-income countries, GSMA, 2015

4 Reforming regulation to accelerate mobile broadband adoption

INDIAN MARKET POLICY PRIORITIES BEST PRACTICES



FUTURE FIT REGULATION

Reduce overall regulatory burden on operators and adopt regulatory framework to the realities of new digital ecosystem



USOF

Review Universal Service Obligation Fund mechanism and gradually reduce



ELECTROMAGNETIC FIELD

Adopt globally accepted technical standards

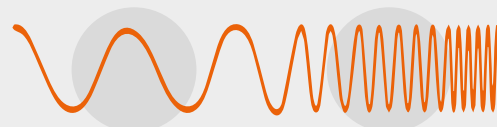
SPECTRUM PRICING

High price affects quality, speed and reach of mobile broadband services



SPECTRUM AVAILABILITY

More spectrum needed beyond 2020 to meet the growing mobile data levels





India boasts the second highest number of mobile subscribers of any country worldwide – testament to the technological transformation that has spread across Indian society over the past decade. The speed of this shift reflects the strong consumer demand for connectivity as well as digital content and services. Nevertheless, only around half of Indian citizens have a mobile subscription, and mobile broadband penetration remains low, at around 15% of the connections base.

Digital India's ambitious goal is universal access to online services, but there is still a long way to go. In addition to the work of operators to expand and improve networks, significant efforts from government and the regulator are needed to create the right conditions for continued investment.

Review and reform in key areas can accelerate mobile broadband access and adoption across

the country. A deep assessment of the regulatory framework is required to more accurately reflect the dynamics of the digital economy, rather than perpetuating an outdated view of the sector. It is also important that the costs, barriers and administrative processes that delay network deployment are reduced. Finally, spectrum policy and pricing play a crucial role in achieving the country's goal of broadband access for all.

4.1 Modernising regulation for Digital India

Telecoms markets have changed considerably over the past few years with the convergence of technologies and services and the emergence of internet players and the digital ecosystem. The lines between telecoms providers and digital content and service providers have blurred, breaking down once-distinct economic segments. The resulting shift in value to other parts of the internet ecosystem has created an investment challenge for mobile operators, which must raise the capital to build the networks to accommodate the growth in internet usage.

While market dynamics can shift quickly, regulation has not kept up, and this is causing increasing market distortion that serves neither consumers nor the government's policy goals. Telecoms service providers (TSPs) are subject to regulatory and

public policy obligations that other players in the digital ecosystem are not, giving the latter more flexibility and competitive advantage.

India will benefit by modernising regulation to the realities of the new digital ecosystem. Obligations tied to a specific technology, rather than the service provided, distort the market, preventing operators from competing equally with other digital market players, which deters industry investment.

The current licensing framework therefore requires an ambitious review. Obligations placed on TSPs should be minimised and modified to become cross-sector regulations. Outdated and ineffective regulations should be removed, giving preference instead to ex post review and enforcement.

4.2 A long-term plan for spectrum required

Indian policymakers' moves to approve spectrum trading and sharing is creditable. With dialogue and collaborative efforts from stakeholders, the government has successfully harmonised and made available additional spectrum in the 1800 MHz and 2100 MHz bands for the 2016 auctions. However, new uses of mobile technology will require greater access to spectrum. Without sufficient spectrum, mobile services will struggle to meet demand and networks will fail to deliver a satisfactory internet experience. The government should therefore continue to free up identified available spectrum for mobile broadband growth, helping it achieve its goals of further economic growth and greater social inclusion.

The long lead time needed for the introduction of new services and new spectrum bands requires long-term planning. India should start planning now for its spectrum needs in 2020–2025. At WRC-15 additional spectrum bands were identified for mobile broadband, particularly the L band (1427–1518 MHz), part of the C band (3.3–3.4 GHz) and supporting sub-700 MHz band (470–698 MHz). The India government should now commit to these bands at the national level and prepare a roadmap for the largely unused bands. At the same time, use of any unlicensed services in the 470–698 MHz band should not compromise licensing the band for mobile broadband and opportunities for mobile operators to introduce new services envisaged over 5G.

Spectrum has no intrinsic value; value is only created through the use of spectrum. Governments can maximise the social gains from spectrum resource by developing a spectrum management framework that supports investment, enables efficient use of spectrum and provides stability.



4.3 Reducing costs of doing business

Mobile operators in India carry significant debt as a result of the high prices for spectrum, administrative fees and levies. Effective and timely deployment of networks requires streamlined approval processes and tax and fee structures conducive to encouraging investment in infrastructure across the country.

While spectrum pricing is a global challenge faced by most economies, it is particularly a concern in India. The country's past experience with spectrum auctions suggests a government focus on short-term revenue maximisation at the expense of long-term growth of the sector. High spectrum fees lead to increased debt levels and reduce the funds

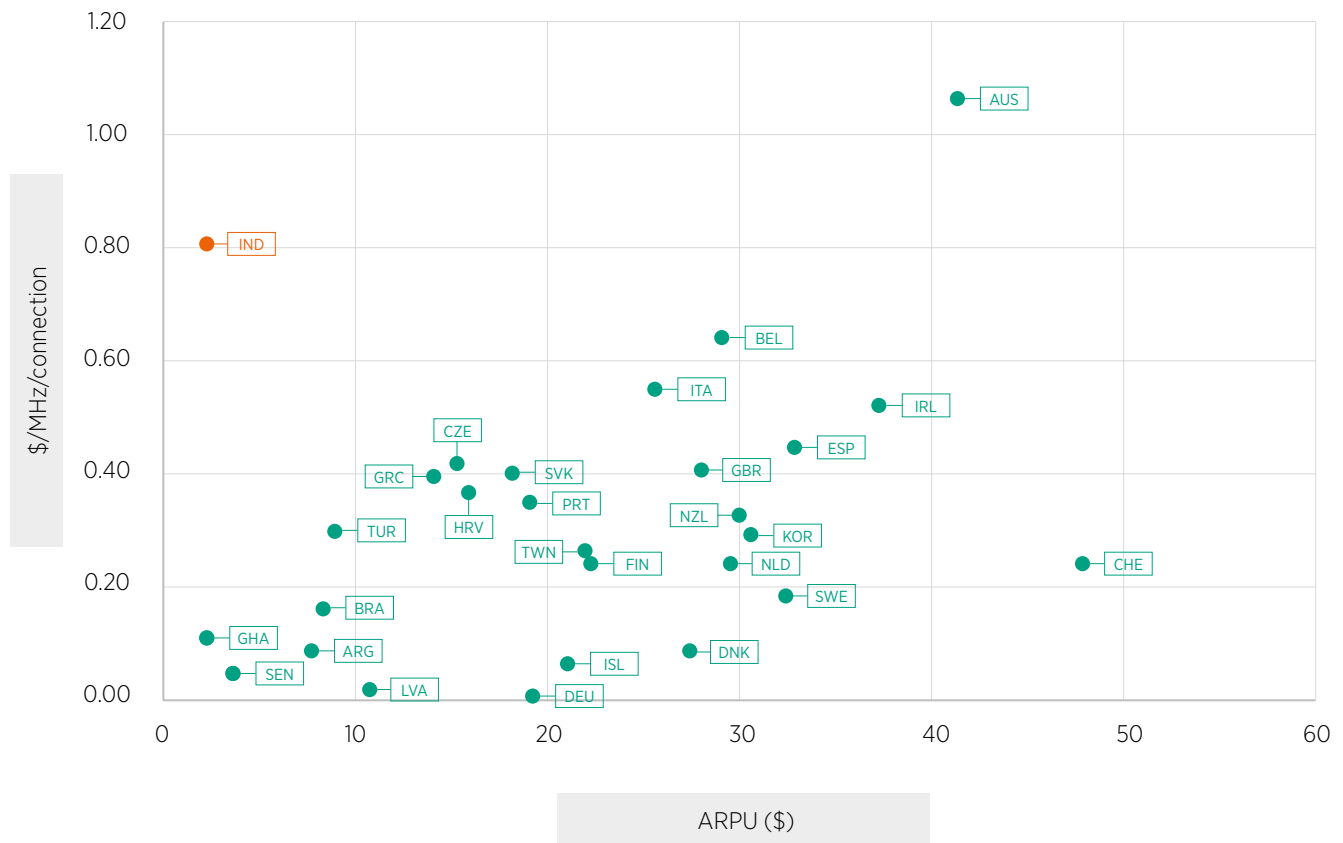
available for investment, thus negatively affecting the quality, speed and reach of mobile broadband services.

In the recently concluded auctions, the government failed to sell any spectrum in the 700 MHz band. All of the spectrum in this sought-after band went unsold due to an unrealistically high reserve price of more than \$60 billion. This could have a negative impact on investment in next-generation networks at a time when demand for mobile data is growing rapidly. There is already a vibrant global ecosystem in the 700 MHz band with more than 100 LTE networks launched worldwide, supported by 469 devices.¹⁴

Figure 14

700 MHz/Digital Dividend spectrum versus ARPU

\$/MHz/connection vs ARPU



Source: GSMA Intelligence

14. Source: LTE User Devices - Status of the LTE Ecosystem report, GSA, October 2016

Regulators should consider local market conditions while setting reserve prices for spectrum auctions. Mobile operators in India have to pay far more for spectrum compared to other markets, even though ARPU is significantly lower.

Reserve prices should be set conservatively so as not to undermine the price-discovery function of the auction that is central to the market-based approach to spectrum management. Where spectrum has been auctioned, any ongoing charges for spectrum use should also be limited to recovering the cost of spectrum management; hence there is scope for further reduction. The government will have a

greater capacity to generate revenues in the long term by enabling the low-cost deployment of mobile broadband infrastructure.¹⁵

The Universal Service Obligation Fund (USOF) levy is also an area that merits review. The current state of mobile coverage in India does not warrant the 5% USOF levy, particularly compared to universal service rates in other countries.¹⁶ The state of connectivity in India would be well served by a review of the effectiveness of the USOF in supporting broadband deployment.

4.4 Improving the ease of doing business

Administrative and regulatory inefficiencies also hinder the rollout of new and improved digital services. Streamlined approval processes are needed to reduce the burden of administrative costs and to prevent delays in the deployment of network resources. India is now taking much-needed steps to simplify its rights-of-way policies to enable faster deployment and discussing the need to formulate Indian telegraph rights-of-way rules. However,

regulatory obstacles such as overly restrictive electromagnetic field (EMF) exposure slow the rollout of networks and discourage investment. Updates in 2017 to the World Health Organization's EMF health risk assessment and the opening of the forthcoming EMF Portal provide an opportunity for India to adopt globally accepted technical standards, removing a barrier to efficient mobile network deployment.

15. Digital Inclusion and mobile sector taxation in India, GSMA, December 2015
16. Universal Fund Study, GSMA, April 2013





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