**Building an enabling environment for access to the Internet**

**ITU: Open Consultation of the ITU CWG-Internet (February – September 2016)**

**GSMA Submission**

The GSMA welcomes the opportunity to respond to the ITU’s Internet CWG addressing *'Building an enabling environment for access to the Internet.’* 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 has a wide variety of programmes and, in particular, our [Mobile for Development Programme](http://www.gsma.com/mobilefordevelopment/) brings together our mobile operator members, the wider mobile industry and the development community to deliver mobile services to underserved people in predominantly emerging markets. We identify opportunities to foster connected societies, accelerate the mobile money ecosystem, and develop mobile identification. Additionally we work to stimulate the development of scalable, life enhancing mobile services with the maximum social and economic impact. Since the establishment of GSMA Mobile for Development, we have partnered with 50 mobile operators, enabled the roll out of 104 initiatives and impacted lives across 49 countries.

**1. What are the elements of an enabling environment to promote internet connectivity?**

Over the last couple of decades, the internet has been at the centre of a transformative shift in how we connect with one another. We live in a world where communication is quicker, information is more available, commerce more efficient and entertainment and education more easily accessible than ever before. Sadly, to date only a minority of the world’s citizens have been included. Globally, 4 billion people remain unconnected, nearly all of whom (90%) are in the developing world.

While this ‘digital divide’ continues to persist, the rapid growth in access to mobile internet offers huge grounds for optimism. Ten years ago, less than 10% of the population in Africa, Asia, the Pacific and the Arab world were online. In the decade since, the percentage has increased dramatically, mainly driven by the growth of mobile. For example: between 2010 and 2015, fixed line broadband penetration in the developing world had a compound annual growth rate of 11% compared with 54% for mobile broadband.[[1]](#footnote-1)

Consumers in the developing world are increasing demand for connectivity. As a result, the mobile industry is increasingly looking towards the developing world to provide future growth: more than 90% of the incremental 1 billion new mobile subscribers forecast by 2020 will come from developing markets. The number of smartphone connections globally will increase by 2.6 billion by 2020, and again around 90% of that growth will come from developing regions. China is already the largest smartphone market, but India will be the real growth driver; it is set to add almost half a billion new connections over the next five years.[[2]](#footnote-2) Of the 4.3 billion adult population living in developing world markets, 2.5 billion adults are not connected to the mobile Internet (3.3 billion if we exclude 2G mobile internet connections). This represents an untapped opportunity for consumers, governments and industry and one that can deliver both positive social and economic impact.

Today, an estimated 30% of the developing world adult population (1.3billion people) is not covered by broadband (3G/4G) mobile networks (compared to less than 5% across developed world markets). The coverage gap is particularly acute in Africa where 50% of the population falls outside the footprint of 3G networks. [[3]](#footnote-3) The economic case for mobile operators to expand coverage into remote areas is challenging because of the cost of deploying, maintaining and powering cell towers in remote, off-grid locations, lower revenues expected from thinly spread, low income populations and policy barriers such as availability of low frequency spectrum (see response to question 3 for more detail).

However, even where network coverage is already available, considerable barriers to adoption of mobile internet services remain. An estimated 2 billion adults in developing world markets already live within a 3G/4G network footprint but do not use broadband mobile internet services. The implication of this is clear: connecting the next billion to the internet is not simply a question of infrastructure. Locally relevant content ecosystems are under-developed, digital illiteracy abounds and affordability issues compromise people’s ability to connect. The digitally excluded either do not know how to access the internet, have the misconception that the internet is only useful for entertainment and therefore not of value, or are frustrated by the lack of content and services in native languages. Women in particular experience these barriers more acutely than men due to social norms and disparities in terms of education and income.

At the end of 2015 around 4.2 billion people, 56% of the world’s population, were still not connected to the internet. At present, around 1.6billion people, nearly 40% of the unconnected population, live outside the footprint of a 3G mobile network.[[4]](#footnote-4) As discussed, the challenges of connecting this group to the internet should not be understated, given the challenging economic case for mobile operators for expanding networks into remote areas. Some challenges include:

* In Asia, mobile internet, particularly mobile broadband (3G and 4G), subscriber penetration remains low, with many people only using voice and text services on their phones. At present, only 27% of the region - approximately 1 billion people - subscribe to mobile broadband services (see figure 3). This means that over 2 billion people in Asia who could subscribe to mobile broadband services (as they have coverage), do not currently do so.[[5]](#footnote-5)
* Although mobile internet adoption is growing fast in Africa, over 50% of internet users still connect to the internet via a 2G network. While low-speed internet connectivity plays an important role in introducing new adopters to the benefits of mobile internet, it is broadband access via 3G and 4G networks that really unlocks the full potential of the digital economy. In, 3G network coverage is only 50% of the population, meaning that nearly 600 million people are not within reach of high-speed mobile internet connectivity. However, of those who are covered, only a small percentage today subscribe to mobile broadband services: 10% in Sub-Saharan Africa, or 100 million people, and 20% in North Africa, or 45 million people. That leaves 457 million people, of which 70% are in Sub-Saharan Africa, who are covered but do not subscribe to mobile broadband. [[6]](#footnote-6)

**2. What are the elements of an enabling environment to promote an affordable Internet?**

The affordability of mobile internet services is one of the key issues impacting the ability of the 4 billion people that are currently unconnected to the internet. It is of most immediate relevance to the 2.5 billion people already covered by 3G networks but who are not using the mobile internet. It also indirectly affects a further 1.6 billion who are not covered by 3G networks. It is estimated that only 43% of the world’s population can afford a 500MB bundle of data and the same figure is as low as 11% in Sub-Saharan Africa.

Low affordability is associated with low penetration rates. For example, the DRC and Niger have some of the highest voice and SMS prices as a share of gross national income (GNI) per capita in Africa with mobile penetration standing at 25% and 21% respectively, some of the lowest around the world. It is estimated that a price drop of 70% could make internet affordable for 80% of the population worldwide, therefore adding a further 2.5 billion mobile internet connections.

There are four key elements that affect the ability of people to pay for mobile services and the retail price they face, which have been used as a framework to inform this strategy proposal: income (and how this is allocated), cost of data and airtime, device cost, and cost of charging the device. An example of the magnitude of the cost components is given below for Kenya.

**Figure 2: Cost of getting online in Kenya (USD per month)**



*Source: Facebook, The State of Connectivity, 2015*

**2.1 Income and value perception**

Income affects the ability of people to purchase mobile services (and mobile internet). In addition, their perception of the value of the internet and the budget allocation choices within their household will impact the price they are willing to pay for these services. Value perception can be a particularly acute barrier amongst women and rural inhabitants.

The Broadband Commission for Sustainable Development has established the internet affordability threshold at 5% of GNI per capita for a 500MB package. However this threshold has been challenged as it does not take into account income inequality. For example, the latest Alliance for Affordable Internet (A4AI) Affordability Report finds that out of the 51 countries surveyed none met the 5% threshold for those living in poverty. Similarly, although 25 out of 51 countries met the threshold for the average income, only 9 did so for the bottom quintile income.[[7]](#footnote-7)

Facebook estimates that, among those that already use the internet, the percentage of household income spent on mobile data services is 3.8% in developing countries and 1.8% in developed countries. This arguably reflects the purchasing patterns of higher income groups.

**2.2 Cost of data and airtime**

The monthly cost of data and airtime is the largest component of accessing and using mobile services. While prices have come down significantly, the price of a 500MB package represents over 11% of average GNI per capita in 25 developing countries and 37% for the bottom quintile income. Innovative marketing models and tariff structures have been providing more affordable and flexible ways of using mobile services. This is particularly relevant for low income and rural populations who face unpredictable income streams and are often unable to commit to large data packages. For example, targeted offers for women have been successful for Ooredoo in Iraq, where a promotion that enabled women to pick their own off/on peak times saw an increase in take up of 40%. Telenor has seen success with offers of very small top up plans for data (20 hours in Myanmar) and streamlined billing.

The standard data package provided by operators is a pre-paid or post-paid bundle that gives access to any site for a capped amount of traffic and/or time. The traffic cap normally ranges between 20MB and 5GB. Service-specific data bundles offer access to specific apps or sites within a time cap.

 More innovative models include earned data, where users receive a set amount of data in exchange for performing an action, such as typically purchasing a service. Users can receive free or discounted data if they top up their accounts, maintain a minimum balance or purchase a handset. For example, Orange Kenya offers users two GB of free data when purchasing a $40 Alcatel Klif handset.[[8]](#footnote-8) Other earned data-models ask the user to interact with advertisements, complete a survey, or similar.[[9]](#footnote-9) An example of this type of scheme is Grameenphone’s Wowbox in Bangladesh.[[10]](#footnote-10)

 An even cheaper way of accessing data is through zero-rated services, which offer free access to specific online services without incurring data usage-charges or it being counted towards monthly data-plans. In the most common business model of zero-rating, the operator does not charge the content provider for offering their content for free. However, in the case of sponsored data schemes, content providers agree to pay for the operator to make their content accessible to users at no data charge.[[11]](#footnote-11)

A survey of eight developing countries by A4AI found that full cost bundles are the primary means to connect to the internet for 50% of users, 21% use public Wi-Fi, followed by service-specific plans (19%), zero-rated plans (4%), and earned data plans (2%). There is conflicting evidence about the commercial success of zero-rating plans. The same A4AI report found that their effectiveness has been limited given only 28% of all zero-rating users switched to paying services. [[12]](#footnote-12)

In addition to these costs, automatic data consumption can utilise up to 5-7MB per day without the user accessing any service and can impact both affordability and battery life. Similarly, app download can be expensive in developing countries where Wi-Fi is often not available.

**2.3 Device cost**

There are contrasting views on whether the price of the device represents an actual barrier to affordability. This may reflect the fact that prices have been declining, there is widespread use of second-hand and sharing models in developing countries and operators have been less involved in the device market. However, evidence suggests that device prices are still a significant barrier to access especially when smartphones are considered: the average price of a smartphone can represent over 7% of GNI for the average income and more than 20% for the bottom quintile. In India a $9 smartphone was launched in 2015 but it was heavily subsidised.

Handset cost is the largest barrier to access for women and bottom of the pyramid consumers. Some operators are already active in addressing this challenge. For example, Orange offers mobile leasing for women and ‘husband&wife’ packages with two devices. Vodafone offers own-branded devices and tablets. Millicom has a number of education-focused initiatives in Latin America, including providing smartphones to schools in Guatemala (however the latter experience showed that lack of digital skills prevented teachers from using them). Many governments also have schemes that provide devices for free or at a reduced cost, a best practice example being the Ivory Coast.

The market for second-hand smartphones is growing and can potentially be leveraged to offer affordable handsets. Deloitte Global has estimated the used smartphone market to have a value of $17 billion in 2016, predicting that consumers globally will sell or trade in approximately 120 million used smartphones. Emerging markets are estimated to be net acquirers of used smartphones. India has a particularly popular smartphone reuse market with 20 million smartphones predicted to be traded in or sold during 2016, constituting approximately 13% of smartphone sales in the country. The average used smartphone selling price is estimated at $90, decreasing over time to $85 by 2020.

**2.4 Smartphone battery charging costs**

Research has shown that the costs for mobile phone charging on average constitute one third of total mobile phone usage costs for users in areas off the electrical grid, and in some cases the spend on the charging process is as much as 50% of the monthly mobile expenditure. In addition, due to logistical hurdles of reaching power access points, very often phones are not in use for at least one day per week due to battery depletion. In Myanmar, Telenor has noted that minutes of use immediately drop by 20-25% during monsoon season, when people relying on solar systems are left without battery for up to 4 days without the possibility to travel. Furthermore, many off-grid users that rely on mobile services for their income, for example rural farmers, often prefer to purchase feature phones as opposed to smartphones on the basis that they offer longer battery life and are more apt to working in the fields.

The group affected by limited power access is vast. In 2013, the total number of people living in homes not connected to the electrical grid was 1.2 billion. In Sub-Saharan Africa over 358 million people were covered by mobile networks but remained without access to electricity, thus experiencing a barrier to connect via their mobile phones.

Enhancing users’ ability and lowering their costs to charge their mobile phones has led to increased ARPU and average airtime spend, which has spurred interest across the industry around alternative charging solutions and initiatives. Operator initiatives have included Digicel’s distribution of solar chargers to consumers in Asia Pacific, and Safaricom’s launch of a low-cost solar handset in Kenya.

**3. What are the elements of an enabling environment to promote the quality of access to the Internet?**

To ensure quality of access to the internet, people need to have the required awareness levels, physical ability, and technical skills to be able to adopt and use the internet. People also need to feel incentivised to make the effort to go online, and once they do, find the user experience valuable enough to keep using the internet.

Beyond the affordability barriers discussed in the previous section, gaps in digital skills and a lack of locally relevant content are key to why people are not connected to the internet. According to the GSMA consumer survey of barriers to adopt and use mobile internet, 72% of non-internet users in Asia cited a lack of availability of locally relevant content, and 38% of non-users in Sub-Saharan Africa cited a lack of digital skills, as the main impediment to their internet adoption and use.[[13]](#footnote-13) These are two principal areas that need to be targeted to ensure people’s improved quality of access to the internet.

* Digital skills: Due to gaps in understanding, unconnected and illiterate populations are currently being left behind in the mobile internet revolution and are not benefitting from the plethora of services and life-enhancing content and information that access to the mobile internet can provide. A huge amount of GSMA research has suggested that a lack of basic digital skills (e.g. knowing how to use the basic functions of a mobile phone, search for information, understand the basic navigation functions of an app) is one of the key reasons why many of those who could connect to the internet are not doing so.

For this reason, the GSMA recently launched – in partnership with Telenor India and Idea Cellular – the [Mobile Internet Skills Training Toolkit](http://www.gsma.com/mobilefordevelopment/programmes/connected-society/mistt/hin) (MISTT). The MISTT has been developed for mobile network operators (MNOs), non-governmental organisations (NGOs), Development Organisations and Governments who 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 entry level smartphone through three services: WhatsApp, YouTube and Google, with information about safety and cost included throughout.

* Locally relevant content: The uneven nature of content (i.e. images, video, text, maps and games) on the internet – heavily skewed towards those living in the developed economies – has long been recognised as an issue, with the ITU highlighting its importance as far back as 2003.[[14]](#footnote-14) Since then, the internet has become far more accessible and affordable, but a large disparity in locally relevant content remains. Thought leaders in this field, including the Internet Society[[15]](#footnote-15), McKinsey[[16]](#footnote-16), Facebook[[17]](#footnote-17) as well as the GSMA[[18]](#footnote-18), have all published research in recent years suggesting that it represents one of the key barriers to digital inclusion.

Quantifying the extent of this problem is difficult. However, the best available indicators suggest this is a serious issue. For content supply, this is the GSMA’s [Mobile Connectivity Index (MCI)](http://www.mobileconnectivityindex.com/), which measures the barriers and enablers to mobile internet connectivity. The Content metric on the Index suggests that content availability and relevance roughly correlate with a country’s economic status, and that developing countries, particularly in MENA, APAC and sub-Saharan Africa, suffer from a lack of locally relevant content relative to their more economically developed peers. This matters, as if people don’t have relevant content they will lack the incentives to come online.

In both areas, women experience these as barriers more acutely than men due to social norms and disparities in terms of education and income, opening up a significant digital divide, and threatening to leave large segments of the population excluded from digital opportunity. Moreover, it is important to recognize that locally relevant content, mobile internet awareness and digital skills are intrinsically linked. On its own, an increase in locally relevant content won’t drive engagement with the mobile internet if people don’t have the skills to access and use it. Equally if people do not understand the fundamental benefits the mobile internet can bring to their lives, whether it be searching for jobs or health information, or just watching a music video, they will not be motivated to learn how to use it.

In addition to these two areas, a wider perspective on the accessibility of the Internet needs to be adopted. For example, if websites, web tools and web technologies are badly designed they can create barriers that exclude people with physical or mental impairments. This issue is evident in the UK, where 25% of people with disabilities have never been online, compared to 10% of non-disabled adults.[[19]](#footnote-19) To address this problem, the Web Accessibility Initiative of the World Wide Web Consortium have developed [Web Content Accessibility Guidelines](https://www.w3.org/TR/WCAG20/) (WCAG), which sets out technical standards for how content developers can make web content more accessible for people with disabilities.

Finally, the initial internet user experience (UX) can be an important determinant for the quality of access to internet, and for incentivising people to continue exploring online. First-time internet users should be encouraged through websites and apps that are designed to be intuitive and accessible. When designing for emerging markets, web and app developers need to overcome additional challenges (e.g. accommodating seamless UX on a low speed connection where data costs are high) and focus on mobile-first design that is compatible for users with unreliable connections. In the case of India, the country’s average internet speed is ranked 115th in the world at 2Mbps, which is the lowest in the Asia-Pacific region[[20]](#footnote-20) and has led internet users to creating petitions[[21]](#footnote-21) for the Telecom Ministry to increase connection speeds. In this regard, the negative internet UX has created a distrust in the internet service provision which is hampering first-time and continuous internet use.

**4. What are the elements of an enabling environment to build confidence and security in the use of the Internet?**

Mobile phones serve as a personal portal to the friends, family, services and resources that people rely on every day. It is therefore essential that the mobile industry delivers safe and secure technologies — complemented by safe and secure mobile apps — that inspire trust and confidence. At the same time, consumers need to be aware of their role in avoiding risks. Mobile technologies are not immune to the issues faced offline and by other forms of information and communication technology, such as criminal activities including online exploitation of children, spamming and device or identity theft. To do this, the mobile industry needs to work with governments, multilateral organisations and nongovernmental organisations to address mobile-related threats to citizens.

**4.1. Keeping customer communications private and secure**

The protection and privacy of customer communications is at the forefront of operators’ concerns. The mobile industry makes every reasonable effort to protect the privacy and integrity of customer and network communications. The barriers to compromising mobile security are very high and research into possible vulnerabilities has generally been of an academic nature. While no security technology is guaranteed to be unbreakable, practical attacks on GSM-based services are extremely rare, as they would require considerable resources, including specialised equipment, computer processing power and a high level of technical expertise beyond the capability of most people. Reports of GSM eavesdropping are not uncommon, but such attacks have not taken place on a wide scale, and UMTS and LTE networks are considerably better protected against eavesdropping risks.

Although mobile malware has not reached predicted epidemic levels, the GSMA is aware of the potential risks and its Mobile Malware Group coordinates the operator response to identified threats. The group facilitates the prompt exchange of information between industry stakeholders and encourages best practice to manage and handle malware by producing comprehensive guidelines for its members. The GSMA supports global security standards for emerging services and acknowledges the role that SIM-based secure elements can play, as an alternative to embedding the security into the handset or an external digital card (microSD), because the SIM card has proven itself to be resilient to attack.

**4.2. Enforcing a consistent approach to privacy regulations**

Currently, the wide range of services available through mobile devices offers varying degrees of privacy protection. To give customers confidence that their personal data is being properly protected, irrespective of service or device, a consistent level of protection must be provided. Mobile operators believe that customer confidence and trust can only be fully achieved when users feel their privacy is appropriately protected. The necessary safeguards should derive from a combination of internationally agreed approaches, national legislation and industry action.

Governments should ensure legislation is technology-neutral and that its rules are applied consistently to all players in the internet ecosystem. Because of the high level of innovation in mobile services, legislation should focus on the overall risk to an individual’s privacy, rather than attempting to legislate for specific types of data. For example, legislation must deal with the risk to an individual arising from a range of different data types and contexts, rather than focusing on individual data types. The mobile industry should ensure privacy risks are considered when designing new apps and services, and develop solutions that provide consumers with simple ways to understand their privacy choices and control their data.

**4.3. Ensuring that illegal content can be swiftly removed or disabled**

The mobile industry is committed to working with law enforcement agencies and appropriate authorities, and to having robust processes in place that enable the swift removal or disabling of confirmed instances of illegal content hosted on their services. ISPs, including mobile operators, are not qualified to decide what is and is not illegal content, the scope of which is wide and varies between countries. As such, they should not be expected to monitor and judge third-party material, whether it is hosted on, or accessed through, their own network. National governments decide what constitutes illegal content in their country; they should be open and transparent about which content is illegal before handing enforcement responsibility to hotlines, law enforcement agencies and industry.

The mobile industry condemns the misuse of its services for sharing child sexual abuse content. The GSMA’s Mobile Alliance Against Child Sexual Abuse Content provides leadership in this area and works proactively to combat the misuse of mobile networks and services by criminals seeking to access or share child sexual abuse content. Regarding copyright infringement and piracy, the mobile industry recognises the importance of proper compensation for rights holders and prevention of unauthorised distribution.

**4.4. Making sure that children are safe when accessing the Internet**

Mobile devices and services enhance the lives of young people. This perspective needs to be embraced, encouraged and better understood by all stakeholders to ensure young people get the maximum benefits from mobile technology. Addressing child online protection is best approached through multi-stakeholder efforts, such as international initiatives related to child online protection, such as the ITU’s [Child Online Protection](http://www.itu.int/en/cop/Pages/default.aspx) programme, or organisations such as the [International Centre for Missing and Exploited Children (ICMEC)](http://www.icmec.org/), [INHOPE](http://www.inhope.org/gns/home.aspx) and [INTERPOL](http://www.interpol.int/).

**5. What is the role of Governments in building an enabling environment?**

Governments have a fundamental role to play in building an enabling environment for increasing the adoption and the health of the internet ecosystem. Below, we provide some recommended actions for governments to address the key barriers to increasing internet access.

**Supporting operators’ efforts to expand mobile broadband coverage:**

* Ensure that taxation and spectrum fees are not overly burdensome, leading to underinvestment on the part of operators. Facilitate cost-effective access to low frequency spectrum and support spectrum re-farming.
* Offer preferred access to the state public infrastructure (e.g. encourage their energy and transport agencies to provide preferred access to mobile operators to lower backhaul CAPEX). Access to public infrastructure should be non-discriminatory.
* Simplify the planning permission process to ensure operators can build sites without having to deal with excessive and complicated bureaucracy.
* Ensure that regulation has kept pace with developments in infrastructure sharing, which has matured considerably over the last decade, particularly in developed countries. Support for all forms of voluntary infrastructure sharing is key.
* Relaxation of Quality of Service requirements, to allow operators to extend network coverage to rural areas to a service standard that is financially and operationally sustainable.
* Context appropriate competition policy, especially concerning market structure.
* Direct public investment towards the development of critical enabling national infrastructure including the national power grids and even open access high capacity core fibre-based communications networks.[[22]](#footnote-22)

**Making access more affordable:**

* Government policies – such as taxes, fees and levies – directly impact the prices paid by mobile internet end users. This is particularly damaging for those at the bottom of the economic pyramid, therefore making the goal of universal access to the internet more difficult to achieve. As a result, all governments should ensure that taxation of mobile services is aligned with best-practice principles. Taxation should be broad based, easily understandable and enforceable, and should not dis-incentivise industry investment. High levels of sector-specific taxation on mobile consumers and operators have a damaging impact on the potential benefits that can arise from a vibrant mobile telecoms sector. Ultimately, by lowering taxation levels, governments can promote digital inclusion, increase productivity and generate economic growth.

**Improving citizens’ digital skills:**

* Bring ICT into the school curriculum and other educational establishments to guarantee that their citizens of tomorrow receive the skills necessary for the modern economy.
* Connecting schools to broadband motivates students and promotes a better learning environment. Devoting sufficient resources to extend a supportive learning environment in rural areas and using e-government services to deliver services in education, health and financial disbursements and other life-enhancing services can be key in lowering awareness and digital literacy barriers.
* Increase awareness among consumers of the benefits of internet usage and steer them away from the perception that the internet is just a tool for entertainment purposes. Through partnerships with mobile operators and NGOs, governments can promote digital skills learning in schools and educational environments, as well as it becoming an economic/social development goal (e.g. digital skills for business).
* Launch awareness campaigns in public forums and in schools to draw attention to harassment of women online and via the mobile phone. This should be coupled with development of legal and policy frameworks to address harassment over mobile phones and mobile internet.

**Increasing the amount of locally relevant online content:**

* Recognise the importance of developing a local content ecosystem in creating a thriving digital economy. Providing a progressive policy environment is essential, including a national digital agenda or strategy.
* E-government services are a major component of locally relevant mobile content in developing countries, and a potentially easy win given the heavy consumer reliance on public services. In Latin America for example, large cities such as Buenos Aires, Sao Paulo, Mexico City, Santiago and Bogota have a significant number of e-government services available. These focus on collecting taxes, dealing with refuse, reporting city problems and other such urban issues. Given the challenges of physically accessing government offices such services are valuable particularly in remote and underserved areas, where mobile internet can be the primary means of delivering e-government services. As well as boosting the availability of locally relevant content, this can also provide the underserved with the tools to interact and engage with their local community.
* Foster an enabling environment in partnership with industry as opposed to in isolation. One space is in attracting and retaining entrepreneurship through start-up ecosystems and innovation hubs. Developing sustainable innovation is a long-term, multi-faceted undertaking that requires a combination of financing assistance, supportive policy environment and educational institutions that feed the start-up community.
1. Source: [ITU](http://www.itu.int/). Between 2010 and 2015, mobile broadband subscriptions went from 4.5% to 39.1%, fixed line broadband increased from 4.2% to 7.1% [↑](#footnote-ref-1)
2. [GSMA Mobile Economy 2016](http://gsmamobileeconomy.com/) [↑](#footnote-ref-2)
3. Source: GSMA [↑](#footnote-ref-3)
4. Source: [GSMA Intelligence](https://gsmaintelligence.com/) [↑](#footnote-ref-4)
5. For more detail, please consult: GSMA, [Consumer barriers to mobile internet adoption in Asia](http://www.gsma.com/mobilefordevelopment/programme/connected-society/consumer-barriers-mobile-internet-adoption-asia%20), 2016 [↑](#footnote-ref-5)
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7. A4AI, Affordability Report, 2016. [↑](#footnote-ref-7)
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22. For detail, please consult: GSMA, [Unlocking Rural Coverage Enablers for Commercially Sustainable Mobile Network Expansion](file:///C%3A/Users/ASmith/Dropbox%20%28GSMA%29/July%2016_Sandeep%20Presentation_IGF%20Paper/IGF%20Paper/Unlocking%20Rural%20Coverage%20Enablers%20for%20Commercially%20Sustainable%20Mobile%20Network%20Expansion), July 2016 [↑](#footnote-ref-22)