Country overview: Bangladesh

August 2014

Mobile for
Development Impact

OMIDYAR NETWORK™

The MasterCard
Foundation

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Mobile for
Development Impact

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Executive summary

Bangladesh is, in many ways, a country ahead of its time in terms of mobile access. Despite being ranked as a low income country, over 50%[1] of the population subscribes to mobile services and it has outpaced all its peers in terms of network coverage. The combination of limited disposable income and more mature mobile usage means the customers of Bangladesh are more discerning. Mobile network operators are looking to innovative value-added services (VAS) to remain competitive and respond to the slowing growth in core mobile services. Services that add value to and improve on the livelihoods of the consumer are more likely to support these goals.

1. Bangladesh is one of the most populous and most densely populated countries in the world. Mobile penetration levels are relatively high, even in rural areas (something not seen in most other emerging markets). However, consumer spending levels are among the lowest in the world. Given the reality that there will be less reliance on growth from new subscribers over the next 4–5 years, mobile operators will need to develop new revenue streams beyond core mobile connectivity – services that support basic human needs around agriculture, education and employment provide a key opportunity.

Bangladesh has a myriad of social challenges, including low literacy rates, child malnutrition, poor access to electricity and a significant urban-rural divide. However, mobile penetration is higher than would be expected given its low-income status. Subscriber penetration reached 40% at the beginning of 2014 and it is expected to grow to 50% by 2020. Bangladesh has a unique pedigree given the transformative impact of the Grameenphone Village Phone programme — a pioneering initiative started in the 1990s to empower rural women through mobile services — and subsequent rapid roll-out of network infrastructure. Between 1997 and 2002 mobile coverage swiftly spread to the majority of the country, many years ahead of other emerging markets. While 3G auctions have only recently been conducted, the provision of basic 2G coverage is widespread. However, the prepaid nature of the market and low incomes of new subscribers means that ARPU levels are low (among the lowest in the world). This underlines the need to develop new revenue streams, we believe the key opportunities are in mobile data and VAS that have both a commercial and social impact.

2. Bangladesh is predominantly a prepaid and 2G market, as 3G has only recently been deployed following delays in the auction process (3G today makes up just 2% of connections). However, mobile internet penetration is over 20%, mostly from 2G feature phones. In other words, there is a latent desire for internet access that is growing. The only question is how fast this occurs, which will depend on affordability and tariff structures.

Bangladesh is a prepaid and 2G market; 97% of connections are prepaid and 98% are 2G. In the first half of 2013, smartphones accounted for only 6% of total handset shipments (a local brand, Symphony Mobile, is the largest vendor with a 37% handset market share of which 92% are feature phones and 8% smartphones). The low 3G penetration is due to the late release of 3G spectrum in 2013. However, mobile internet has reached 20% penetration

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[1] Excluding youth under 16

by delivering mobile data services using 2G networks. The combination of 3G spectrum now in play, solid existing site coverage, and consumer appetite for internet use in urban and rural areas means this trend is accelerating (we expect 3G connections to surpass 2G by 2020). The only question is pace: this could very well occur faster than expected, if the number one challenge of affordable access (both airtime and handsets) can be overcome.

3. The use of mobile in driving socio-economic improvement is on the rise. From its pioneering roots in microfinance 30 years ago, the country now has a relatively solid mobile consumer base, much of which are underserved in core life needs. Mobile operators are demonstrating the potential for social VAS, and while we expect this to continue to grow, it will take time. There is still an opportunity for public and private investment in providing seed capital for the innovation that is not yet 'market-led', with a key role for government in facilitating this process.

While it is true that the majority of unconnected individuals reside in rural areas, this is due to the fact that the majority of population are in rural areas. The opportunity to address the underserved in urban settings is far from insignificant — we estimate six million city dwellers are yet to own a mobile. There are a host of sector opportunities that result from the widespread access to mobile phones yet the lack of access to basic services — including responding to natural disasters, driving gains in agricultural productivity, improving educational and employment outcomes, or increasing financial inclusion.

So, how should the various players in the Mobile for Development ecosystem respond to this opportunity?

Mobile operators are increasingly involved in leading commercial VAS that carry social impact and, although there are challenges, we expect this to continue over the next two to three years. This is, on its own, a positive story given the implicit commercial value of such services attributed through operator investment. However, in order to drive increases in ARPU, new approaches to marketing and pricing these services would help, particularly as personal incomes rise. For example, use of flexible credit scoring techniques; experimenting to include VAS as part of bundle packages alongside traditional access services (voice, SMS and data); or using VAS as a more defined tool for customer retention (e.g. brand loyalty).

Donors and NGOs have a growing presence providing seed capital for services that have not yet scaled and are not market-led (BRAC is a notable example). However, we believe there is still an important untapped opportunity for the venture capital (VC) and impact investor community. Dhaka is not yet an innovation hub on the scale of regional peers such as Bangalore, Colombo or (further afield) Nairobi. However, this is not due to a lack of entrepreneurs. There are clear challenges faced by private investors seeking to place capital in Bangladesh ICT, including the market operating environment and the lower likelihood of exit opportunities. To accelerate the process of these barriers being overcome, we believe it is important investors play a direct role by fostering an enabling environment of education and mentorship in addition to capital. This is not a short term game, but the long term rewards for early entrants are attractive.

Government also has an important role to play. Bangladesh has an opportune landscape for Mobile for Development services – high mobile penetration and a number of social challenges that can demonstrably be helped through mobile technology. The government set out laudable and ambitious goals around expanding digital empowerment to the mid and low income underserved population as part of its flagship "Digital Bangladesh" vision. In order to execute this successfully, public policy priorities should be focused on ensuring investment security (particularly for foreign capital), and liquidity in public markets, both of which would help would-be investors (and indeed mobile operators) with more reliable decision making.

National context

Located in South Asia, Bangladesh is the world's eighth-most populous country and among the most densely populated countries with 1,188 people per square kilometre. The population is very young, with just over half under 25 years of age, and there is an equal male-female split. Bangladesh was part of what was formerly known as East Pakistan and became independent in 1971, when the two parts of Pakistan split after a bitter war which drew in neighbouring India. After spending 15 years under military rule and restoring democracy in 1991, Bangladesh has had a period of relative calm and economic progress, however it continues to struggle with natural calamities owing to its low-lying geography and vulnerability to floods and cyclones together with other socio-economic problems.

Since independence, Bangladesh has made significant improvements in human and social development indicators, including gender equality, universal primary education, food production, and population control. It has also made improvements in healthcare: life expectancy is higher than any other country in the region (except Nepal), while infant, under-five and maternal mortality rates are better than other countries in the region. Yet, despite improved survival rates, nearly half of children have chronic malnutrition. One of the biggest problems in Bangladesh is the deep and widespread poverty levels since approximately 50 million people live in poverty, on less than $2 per day. This it is primarily a rural phenomenon and 85% of the country's poor live in rural areas. The urban-rural divide is evident in many socio-economic aspects (see Figure 1).
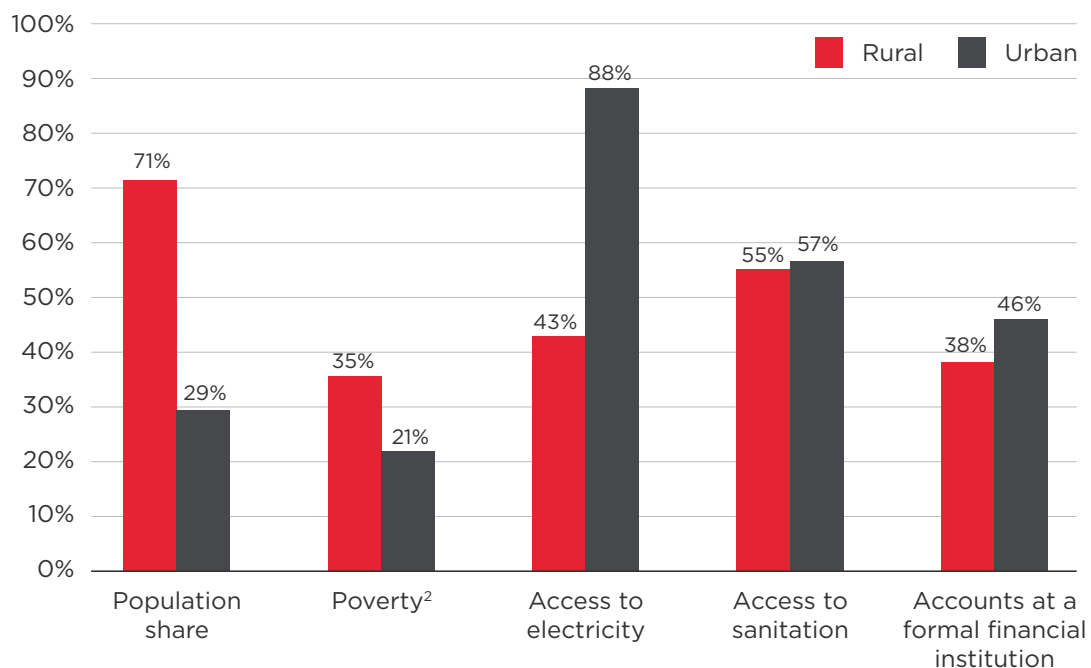

Figure 1: Urban vs rural gap, 2010
Source: World Bank

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[2] Poverty headcount ratio at urban and rural poverty lines

Bangladesh's GDP has been growing at an average of 6% each year for the past ten years. However, it is still a low income economy with a GDP per capita of just over $800. But there is great potential for growth – Bangladesh is committed to becoming a middle-income country by 2021, its 50th year of independence, and economist Jim O'Neil believes that Bangladesh is part of the "next eleven," a set of eleven countries with a high potential of becoming the world's largest economies in the 21st century, along with the BRIC countries.

Bangladesh is one of the world's leading exporters of textiles and garments, as well as fish, seafood and jute. The majority of employment is in agriculture, comprising nearly 50% of the workforce and contributing 17% of the country's GDP. The country has diversified its economy through a growing industrial sector which contributes 29% of GDP; in 2005 more than three-quarters of Bangladesh's export earnings came from the garment industry. Another significant contributor to the development of the economy has been the propagation of microcredit by the Grameen Bank (see "Mobile for Development opportunity" section).

Mobile for Development opportunity

Understanding the past to envisage the future

To understand the modern opportunity in Bangladesh of mobile in driving socio-economic improvement, it is helpful to first recast the discussion back 30 years to its roots in microfinance. In 1976, Professor Muhammad Yunus launched a research project to examine the possibility of designing a credit delivery system to provide banking services for the rural underserved and named this institution Grameen Bank (meaning 'rural' in Bangla). The objectives of the project were focused on using financial access to empower isolated, predominantly low income communities and, in turn, catalyse a micro entrepreneurship market through self-employment. The project was extended to different districts in Bangladesh in 1979, and finally in 1983 the Grameen Bank Project was transformed into an independent bank (which still exists today as a member-led cooperative).

Jumping forwards and following in Yunus's footsteps, in 1994 Iqbal Quadir, a US-based native Bangladeshi entrepreneur, approached Grameen Bank to use its micro credit mechanism to establish a nationwide telecommunication network. In parallel with the launch of commercial mobile services for Grameenphone in 1997, the Grameenphone Village Phone Program was founded to target micro credit customers (who were mostly women) in a symbiotic micro economy — entrepreneurs were loaned capital for mobile phones, which they could rent out to others, generating an income flow (and the ability to repay the cost of the loan).

The significance of this is that, despite it being a low income country, Bangladesh is now a market in many ways ahead of its time. While we believe that unique mobile subscriber penetration is around 42%, a third of the Bangladesh population are under 16. Adjusting for this (few will own mobiles outright, with most accessing through sharing arrangements), ownership among adults is actually above 50% (see Figure 2). Here, a more interesting perspective of the urban-rural divide comes into view, from which we observe three important points. In rural areas, penetration is around 50%, with this enabled from widespread coverage having been established much earlier than in neighbouring countries. Second, while it is true the majority of the unconnected are in rural areas, there is a not insignificant untapped audience of 6 million individuals in urban centres who do not own a mobile – there is no lack of network coverage, but access remains unaffordable. Finally, and perhaps most important, the relatively maturing position of Bangladesh means that operators have a shorter time period to rely purely on new subscribers for growth, with the impetus for new sources of revenue a nearer term reality than many comparable emerging markets.
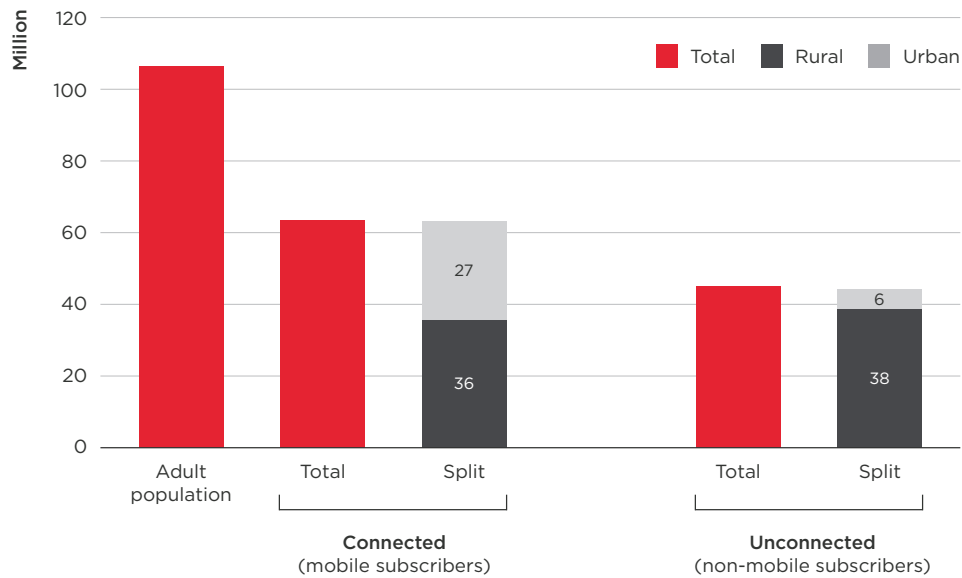
Figure 2: The opportunity is not just in rural areas
Source: GSMA Intelligence, IFPRI

Indeed, operators have a large footprint in the value added services space, with Robi and Bangalink most active. Most of this is concentrated in entertainment and social media, with a limited, although growing, presence in commercial services targeting core life needs in banking, agriculture and education amongst others (see Figure 3). This is also reflected in our own tracker, with Bangladesh having a relatively low number of active M4D services (53, or roughly one per million mobile subscribers) compared to its benchmarked peers.
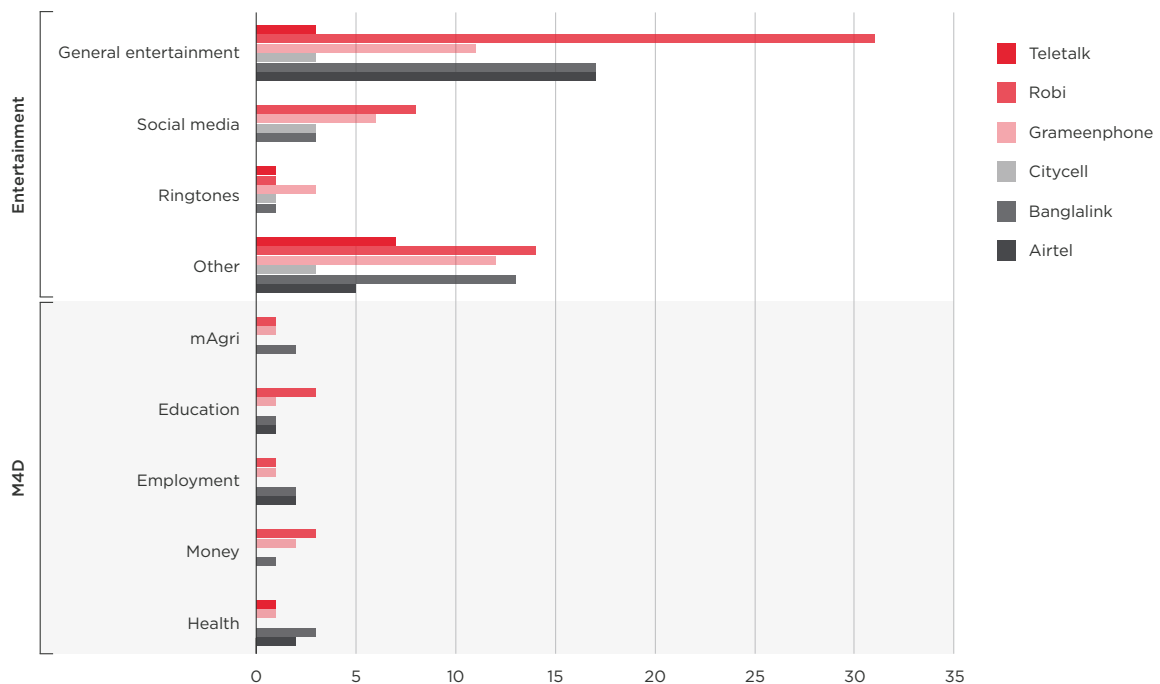

Figure 3: Commercial VAS offered by operators in Bangladesh
Source: Operator websites

Note: general entertainment includes news, religion, games, music, etc. Other includes services to recharge prepaid, receiver pays for calls/ SMS, missed called alerts, etc.

However, these products and services are increasingly being led by operators. Market forces are evidently at work — operators have limited budgets both in investment and corporate finance, and allocating these to M4D VAS is indicative of the perceived return opportunity. We believe operators will continue to grow their position as the dominant players in M4D given weakening subscriber growth, declining ARPU and a drive for revenue diversification coupled with consumer demand for services adding value to livelihood, and rising mobile internet penetration. However, this takes time. There is an opportunity for seed capital to bolster innovative services that have not yet scaled. NGOs are also increasingly playing in the space, accounting for around 25% of services (see "Innovation and Investment" section), considerably higher than in other emerging countries (Nigeria, as one example, NGOs account for less than 10%). This leaves a still largely unrealised opportunity for other investors — donors, VCs and impact investors — to enter, particularly those based in the country or region.

For its part, the Bangladesh government has been heavily involved in promoting ICT, fronted by the flagship initiative ("Digital Bangladesh by 2021") as part of the 2008 election manifesto. The vision proposes to mainstream ICTs as a tool for digital empowerment through human resource development, increasing mobile penetration, digitising government services to increase access, and integrating ICT in business. It has complemented this with the Access to Information (A2I) programme from 2007, with the goal of leveraging ICT in public service delivery and promoting the use of ICT in social sectors such as education, health and agriculture. This project was supported by UNDP and USAID. The programme first focused on increasing access to service, and then on simplifying service delivery. The programme has been successful in decreasing time, cost and barriers in accessing government services; in just a few years, the number of underserved people benefitting from e-services went from zero to 4.5 million every month. Access centres now exist in 4,545 rural local government institutions and 727 locations in urban municipalities. Moving forwards, we believe the key challenges for government are in attracting investment to ICT, especially by creating a transparent regulatory environment for investors to operate within.

We will discuss the investment and innovation market, but first we will highlight opportunities for commercial engagement in some of the key sub-sectors within the M4D space.

Disaster response

Bangladesh is one of the most environmentally vulnerable countries in the world, ranking in the top 15 for number of natural disasters per year. The most common natural disasters in the world are hydrological (floods) and meteorological (storms). Bangladesh is exposed to a roughly even split of droughts, floods and cyclones amounting to an average of 8 events per year, concentrated in the annual monsoon season (see Figure 4). On average 5% of the population (or 7.5 million people) in Bangladesh are affected by a natural disaster each year, among the highest in the world (for comparison, Somalia and the Philippines are around 10%, with the US at 1%). Between 2008 and 2012 nearly three million people were displaced by natural disasters related to weather and geophysical hazards[3]. The government now estimates that 20–30 million people could be displaced by the effects of

[3] These do not include droughts, nuclear or industrial accidents and epidemics

climate change by 2050.

During natural disasters it is very difficult to get accurate and timely information on population movements, which is crucial for ensuring that interventions are more efficient and provided to the right places. Today, given the widespread availability and use of mobile, this technology can be used to monitor population movements and contribute to this humanitarian data post-disaster. An example of an organisation doing this is Flowminder (for more information see case study).
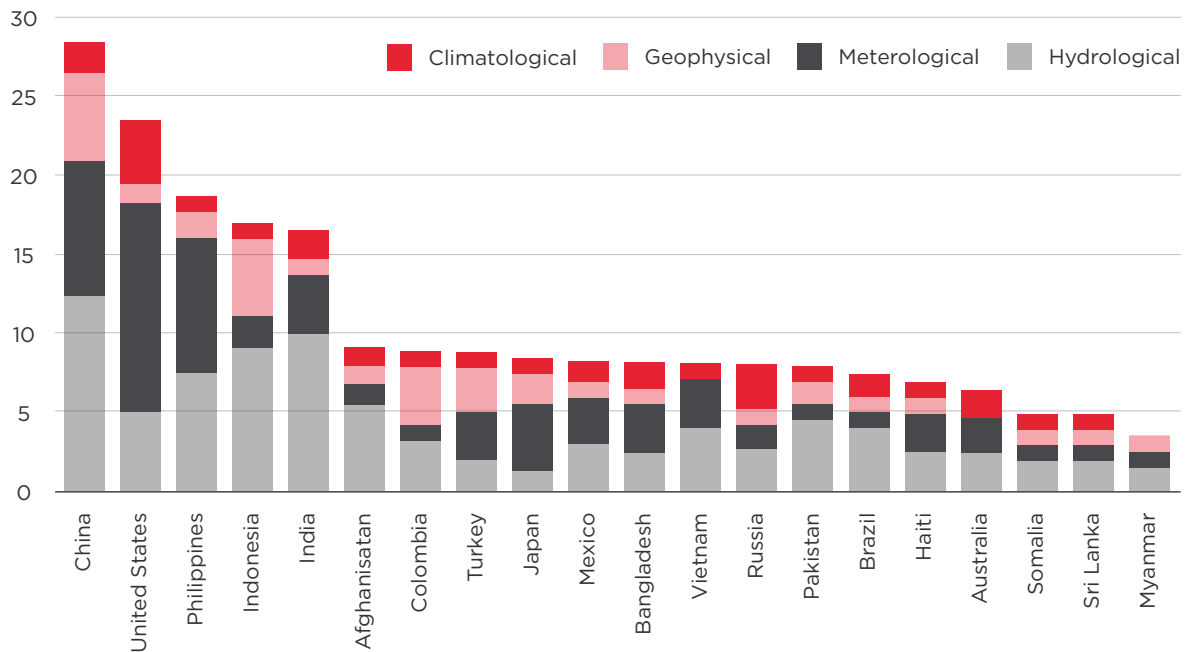

Figure 4: Average number of natural disasters by disaster type per year (10 year average), 2003–13
Source: GSMA Intelligence, EM-DAT

Note: climatological includes drought, extreme temperature and wildlife; geophysical includes earthquakes, mass movement dry and volcanos; meteorological represents storms and hydrological includes flooding and mass movement wet

The opportunity in mobile is multi-pronged, underpinned by the relatively high level of mobile access even in exposed areas. First, the basic provision of 2G connectivity for calls and SMS leading up to and in the immediate aftermath of a disaster. Second, the use of call data records (CDRs) means that individual migratory patterns can be tracked over the same period, providing evidence to civilian authorities of, for example, urban over-densification. Finally, mobile money platforms allow remittances to be sent to displaced family members in the absence of physical connections or modes of transaction. For the mobile operators, this is not a revenue opportunity, but one of solidifying customer trust and loyalty. Government support for disaster response services is growing, and there are a number of organisations active in the space. The key challenge is in forming effective partnerships with operators to take advantage of their network scale.

Special feature: In conversation with Linus Bengtsson
Co-founder and Executive Director, Flowminder

Can you tell us what Flowminder is and what you do?

"Flowminder is an NGO based in Stockholm focussing on research into disaster response, infectious diseases and socio-economic analysis. All of the team members are academics with a faculty position at a university (e.g. Harvard University, Karolinska Institute and Stockholm School of Economics). In addition, we have a number of collaborators from other institutions. As academics, we always publish our work so all the results and the methodology are publicly available for other researchers.

We have pioneered a number of applications using anonymous call data records (CDRs) from mobile operators to solve public health issues. In 2009 Andy Tatem at Flowminder launched a project to use operator data in Tanzania to understand how malaria was imported into Zanzibar from the mainland, thus improving malaria elimination planning on the island. We initiated the first work on using mobile operator data in disaster response with Digicel Haiti to follow population displacement and mobility in Haiti after the earthquake in 2010 as well as during the cholera outbreak the same year."

Can you talk about the project you are currently working on in Bangladesh?

"We are undertaking a pilot study on the impacts of the cyclonic storm Mahasen, which struck Bangladesh in May 2013. There is a lot of interest from the different ministries on how to take this forward operationally. During pilot projects, we usually work by engaging operators, government ministries and NGOs to get everybody on-board and understand the methodology. We can then use this as a platform for long-term work. In Bangladesh, we work with Grameenphone, Telenor, ICCCAD and United Nations University. We are looking both at the short term effects as to how people react and move in response to the cyclone, and also at the long term and wide-area effects, primarily on migration."

Can you share some of your findings from your current study in Bangladesh?

"In terms of preliminary findings, what we see in Bangladesh is consistent with findings from previous studies of cyclone impacts. For the most part we don't see large displacements, such as those we documented after the earthquake in Haiti. The low level of displacement is likely due to Mahasen, being much weaker than the largest super typhoons. We can see patterns of how people move in preparation for the cyclone and we look at movements during the cyclone. In Bangladesh, there are a lot of cyclone evacuation centres around the coast. As the cyclone approaches, we can see in detail how people are moving and we see that in certain areas there may be a tendency to move to the cyclone centres too late. By having this type of information the government can investigate if this is related to the number of shelters or to the communication patterns in the warning messages, or other reasons.

Looking at the long-term changes, we see both significant gains in population in some areas (mostly urban), potentially through a decreased economic viability in others (mostly rural), although these analyses are not finalised. This is a common coping mechanism; if rural economic resources are damaged, people tend to temporarily migrate to urban areas to work as construction workers or in garment factories, and returning after a period of time. These are patterns that are poorly understood on a large scale. It is well known that there is a lot of cyclic temporary migration, and that some of these people will migrate permanently, but this is difficult to quantify. We help to quantify these movements and understand them on a wider scale. Hopefully in the future it will provide a better understanding of what makes certain people migrate."

From what you have seen, are migration patterns specific to a country or a type of disaster?

"The value of mobile phone data is that we are able to look at these patterns as they are happening and very rapidly analyse the data. There are no generalised patterns that apply to every country or every disaster. Traditionally survey data collected after disasters shows very different migration patterns in different countries. Migration patterns also depend on the disaster, but more crucially they depend on the resilience of the population and the post-disaster habitability of the area, which differ widely from one place to another and between families. Moving also demand resources so some people who have experienced very heavy losses may migrate less, as they have fewer resources to pay for the move. It has a lot to do with your livelihood, resources, previous experience and what you expect from the future."

What data do you look at for your analysis?

"We look at CDR data, which provides information on location and movement. Currently we just track the tower locations of anonymous calls. In addition, we also use top-up data, thus we can see how consumption patterns change over time. We use this data as a proxy for people's financial situation after a disaster. We see that people top-up a lot before a cyclone, evidence of how important it is to communicate during a disaster. A policy implication could be to allow people to communicate either by providing credit or certain free calls before, during and after such an event."

Have you seen operator willingness to collaborate change since your project in Haiti?

"We collaborate with several operators globally. It is easier than before, but by no means "easy" and I don't think it should be either. Although the operator data is very valuable for disaster response, it is sensitive data, and it naturally takes some time to build trust between collaboration parties. In Bangladesh we are currently at a pilot phase, but we hope we can continue to do work here, so it is important to build long-term relationships. We have an official endorsement from the ministry of disaster response and relief, as well as from the regulator, which I think has made it easier for Grameenphone to take part in the work. The minister for disaster response is very interested in this project since for them this is a completely new area and they see the potential in our analysis. There is a lot of excitement from different parties, so now we want to finalize the results and get a good follow-up dialogue. Although Bangladeshi researchers are already part of the project, we would very much like to be able to work with Bangladeshi researchers and analysts

so that this work in the long run can get integrated into the national standard operating procedures for disaster response."

How accurate is your data compared to other sources?

"Based on our work in Haiti we published a comparative analysis contrasting mobile phone data and a large retrospective household survey, and we found a very good correlation. In the long run we aim to build up similar validation studies in multiple contexts, including Bangladesh. Although networks are very resilient, there will also be cases where the network completely collapses for extended periods of time, for which no data will be provided. In some settings with skewed user base and limited radio-coverage, this method will not be of much value. Getting the estimates as good as possible is a long-term research question that will keep us busy for the foreseeable future. It is especially important to develop methods to adequately assess the movements of the most vulnerable people like the poor, children, pregnant and lactating women and the elderly. The alternatives to this method are however very limited. It is simply extremely hard to manually count individuals in sometimes-unsafe settings, moving at different speeds, in different directions, across thousands of square kilometres. "

What are the main challenges and opportunities in using "big data" to address disaster response?

"The opportunities are very clear – you can get a rapid picture of population movement after disasters to be able to locate people in need and to understand better which areas are severely affected. There are two sets of challenges, firstly a policy one, getting regulators on board so that operators feel safe. The second challenge is on the scientific side; to optimise the estimates and account for biases."

Agriculture

With 71% of the population and 85% of the country's poor living in rural areas, agriculture is an important source of employment and contribution to GDP in the country. However, there are some challenges in agriculture in Bangladesh related to weak rural institutions and vulnerability to natural disasters. Another challenge, which is common to most developing countries, is the low agricultural productivity considering the amount of labour force in agriculture. On average, in developing countries 40% of the labour force is in agriculture, compared to just 3% in the developed world. However, the productivity in developed countries is 1.5 times greater than that of developing countries (see Figures 5 and 6). The same is true for Bangladesh; if we compare Bangladesh with the UK, we see that in the former nearly 50% of manpower is in agriculture compared to just 1% in the latter, but the productivity in the UK is more than double that of Bangladesh.
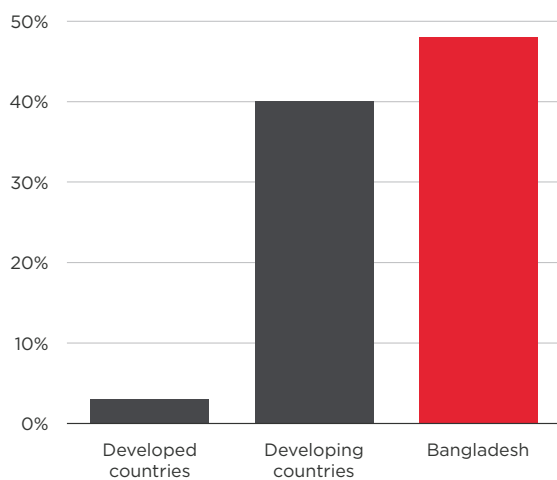

Figure 5: Labour force in agriculture, 2012
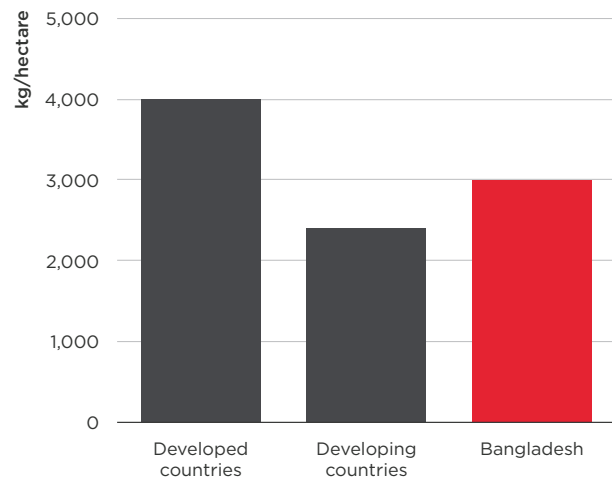*Source: World Bank*

Figure 6: Agriculture productivity, 2012
Source: World Bank

We believe there are four main drivers behind the productivity gap:

- Lack of information on agricultural inputs and nutrition; prices for crops across markets and accurate weather information
- Access to markets is problematic; there is a gap in matching supply and demand since intermediaries usually act in silos and there are poor logistics which cause wastage
- Financial exclusion; the availability of loans, payment facilities, savings and insurance for protection against crop failure, and
- Availability of modern agricultural machinery

The first three causes can be addressed through mobile agriculture services. Farmers currently refer to a variety of sources for their information, (see Table 1) which can be time consuming. Using mobile to collate information and advisory services focussed on livestock and nutrition, market prices and weather forecasts would greatly streamline this process for farmers, at the same time as offering operators and service providers a chance to create social benefits for their users, enhancing customer loyalty. Secondly,

using mobile supply chain services can provide real time visibility of supplier networks and track and trace products in supply chain. Finally, mobile financial services for farmers, such as savings, credit products and micro insurance for crops can increase financial inclusion.

Type of information sought	Extension officer	Private sector	Peer group	Lead farmer	Television	Other
High-yielding crop/species	35%	22%	13%	7%	19%	4%
Cultivation techniques	21%	11%	19%	11%	25%	15%
Soil condition	35%	4%	10%	7%	14%	30%
Seed usage	20%	39%	21%	8%	4%	8%
Pesticide usage	14%	65%	5%	7%	3%	6%
Fertiliser usage	16%	56%	9%	8%	2%	10%
Irrigation methods	12%	12%	24%	14%	5%	33%
Market access	7%	20%	41%	15%	5%	12%
Weather forecast	3%	1%	4%	1%	62%	28%

Principal information source (column group header above: Extension officer, Private sector, Peer group, Lead farmer, Television, Other)

Table 1: Principal sources of agricultural information among farming population in Bangladesh, 2011
Source: Orgquest, Katalyst

Note: sample population of 500 cereal, staple and vegetable farmers

There is room for significant growth in operator involvement in reaching the 22 million agricultural workers that have mobile phones; in addition, by offering mobile agriculture services operators have the potential to attract 14 million new customers to their subscriber base (see Figure 7) by giving them a reason to connect that they may not have had previously. Robi, Banglalink and Grameenphone are currently offering mobile agricultural services, mainly providing market information, agricultural news and weather information via interactive voice response (IVR) or native voice services in both Bangla and English. However, these services have not scaled yet; a study carried out by Katalyst and The Springfield Centre estimates that 200,000 farmers benefitted in 2012 from the two mAgri services offered by Banglalink and Grameenphone[4]. This is a significant number, but it represents only 1% of the total labour force in agriculture in Bangladesh. Offering voice-based services is an important step given the high rates of illiteracy among the target audience. However, we believe there is still a lack of awareness of these services and their value proposition (especially important for individuals with low disposable incomes). Operators and co-operatives can play a larger role in improving this, such as through rural distribution centres and below the line advertising.

[4] Source: *Making ICT work for Bangladesh's Farmers*, November 2012
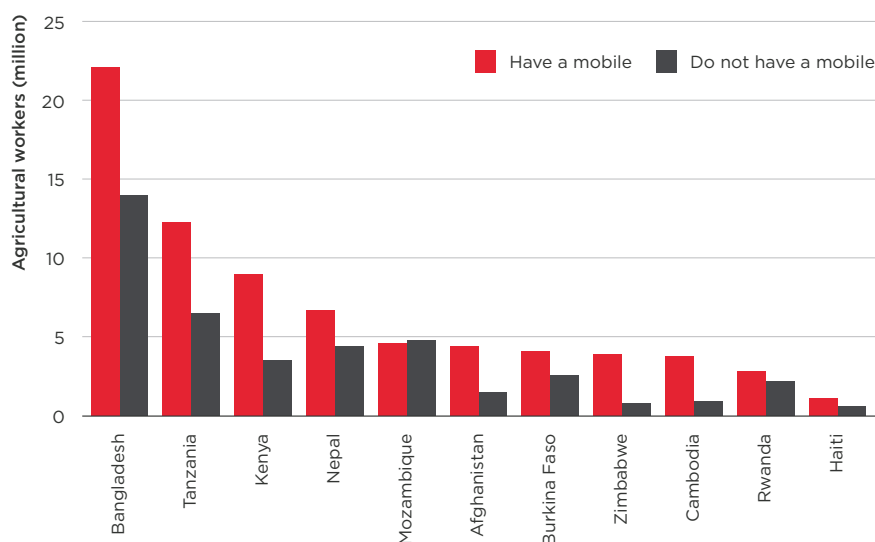
Figure 7: Market opportunity for mAgri VAS
Source: GSMA Intelligence

Mobile Money

Today 40% of Bangladesh adults have an account at a formal institution, leaving over half without one[5]. In order to ensure access to financial services to the unbanked and given the increase in mobile adoption, in September 2011 the Bangladesh Central Bank issued guidelines for mobile financial services (MFS). The central bank has chosen to allow only banks to provide the services, with mobile operators and microfinance organisations active partners. The role of operators is limited only to technology provider to the banks which have been approved to offer mobile financial services. Operators will need to secure approval from BTRC to allow USSD connectivity to the banks they have a partnership with; once approved by BTRC, subscribers of the respective mobile operator will be able to access MFS of that bank. All banks are licenced through the central bank (Bank of Bangladesh) and can offer different types of services, such as:

- Cash in /out using mobile account through agents, bank branches, ATMs, MNO outlets
- Disbursement of inward foreign remittances (outward remittances are not allowed)
- Person to person (P2P) payments
- Person to business (P2B) payments (utility bill payments and merchant payments)
- Business to person (B2P) payments (salary disbursement, dividend and refund warrant payments, vendor payments, etc.)
- Government to person (G2P) and person to government (P2G) payments
- Other payments (like microfinance, overdrawn facility, insurance premium, DPS, etc.)

Banks are responsible of selecting, training, equipping and monitoring agents. Agents, together with banks, are allowed to acquire new customers, however, the bank is responsible for ensuring that the mobile account is activated, that "know your customer" (KYC) protocols have been followed and that the documentation provided to register is verified. In addition, banks are responsible for ensuring the technological infrastructure is

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[5] Source: Global Findex, World Bank

in place to protect customer privacy and data exchange. Banks can decide how much to charge for services and can link their MFS with those of other banks.

MFS have increased rapidly; the number of agents went from 9,000 to over 414,000 in just over 2 years and they cover all regions in Bangladesh (see Table 2). Two leaders have emerged, BRAC bank/bKash and Dutch Bangla Bank; both have formed partnerships with mobile operators and have access to 88% and 75% of mobile subscribers respectively. For bKash in particular, this has translated into a strong set of numbers: 90,000 agents, 11.6 million registered users and five million active customers (or around 75% of the total in the country)[6].

bKash's growth has been driven by three main factors[7]. Firstly, BRAC is the only bank whose business model is solely based on delivering mobile financial services. The focus of bKash is only on building its core business and is not considered as an alternative delivery channel to reach customers. Secondly, bKash was not born out of a pilot project, but it aimed to scale from launch. Finally, the 2011 regulation created a favourable framework for bKash's success to the exclusion of mobile operators or their subsidiaries. The regulatory design has given bKash the competitive edge overt mobile operators, which have proven to be very successful in providing mobile financial services in countries were regulation is more enabling.

Description	March 2012	December 2013	June 2014
Number of agents	9,093	188,647	414,170
Number of registered accounts (million)	0.4	13.2	16.7
Number of active accounts (million)	NA	6.5	6.7
Total transactions ($, million)	$25.9	$857.4	$1,100.1

Table 2: Mobile financial services
Source: Bangladesh Bank

At a market level, there are more than 16 million mobile money subscribers in Bangladesh today, of which 40% are active accounts (see Table 2); this is above the global average of 30%[8]. However, there is still much room for growth as only 16% of adults are mobile money users, and it is here that we believe operators are well positioned to provide leadership, and that there is therefore a strong case for market liberalisation to permit this. For starters, most operators in the country are already involved in the value chain through partnerships with banks to facilitate MFS by providing connectivity and distribution. Network scale is a key asset in reaching the still financially unserved audience but who are mobile subscribers — indeed, GSMA's annual global survey of mobile money services has consistently shown operator-led services to be among the fastest growing.

[6] Source: *Your Neighbour is Your Banker, Your Community is Your Platform*, ACCION, April 2014
[7] Source: *bKash Bangladesh: A Fast Start for Mobile Financial Services*, CGAP, July 2014
[8] Source: Mobile Financial Services for the Unbanked: State of the Industry 2013, GSMA, February 2014

Security concerns have arisen given that the majority of transactions currently go over the counter (OTC) via an agent, circumventing registration and KYC checks[9]. Indeed 85% of mobile money users have not registered their own account and the majority prefers to conduct transactions through an agent's account[10]. While OTC via an agent properly trained on the necessary anti-money laundering (AML) risks and due diligence may, in special circumstances, be permitted, the failure of agents to carry out any KYC checks exposes MFS providers to money laundering and terrorism financing risks and could result in Bangladesh facing international reprisals for non-compliance with internationally accepted AML/CFT (countering financing of terrorism) controls.

Finally, operators can draw upon their local area and customer expertise to more effectively communicate value proposition of mobile financial services. All of these come into play given the importance of speed and scale if the government is to achieve its vision of driving universal financial inclusion. Under the current regulatory framework, the Bank of Bangladesh carries out a prudential assessment of the bank's (or its subsidiary's) preparedness to offer MFS together with on-going reporting obligations. This prudential assessment can be extended to MNOs (or their subsidiaries) as the risk profile of the MFS service remains the same for bank subsidiaries and non-bank subsidiaries[11]. Indeed by adopting a non-discriminatory approach to the regulation of MFS under which banks and non-banks, particularly MNO subsidiaries, are permitted to issue e-money, the Bank of Bangladesh will have boosted access to financial services in Bangladesh accruing the following benefits:

- Improving efficiencies and scale to the national payments system
- Addressing any regulatory conflict or arbitrage concerns as the regulated institution will be a special purpose vehicle specifically incorporated to provide MFS
- Unlock capital held back by MNOs, bringing investment and spurring innovation
- Enhance efficiency in distribution of MFS through existing wide-scale distribution networks
- Inspire public confidence in MFS as MNOs will utilise their resources to educate the public and drive mass recruitment campaigns, reversing the current lack of customer awareness on the product and general customer apathy.

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[9] Some mobile money services are being offered primarily over-the-counter (OTC). In such cases, a mobile money agent performs the transactions on behalf of the customer, who does not need to have a mobile money account to use the service and does not necessarily need to provide KYC. Services that don't offer OTC register users by requesting KYC and a mobile money account (wallet) is opened in the users' name. Some services offer both OTC and mobile money accounts

[10] Source: Bangladesh - Quicksights Report FII Tracker Survey, Financial Inclusion Insights, April 2014

[11] A functional approach to regulation focuses on applying the same rules for the same kind of service (whether offered by a bank or non-bank) while an institutional specific approach focuses on regulating the institution providing the services. For a more detailed explanation of this point and for references see Mobile Money: Enabling Regulatory Solutions, Simone di Castri, GSMA, 2013

Education and employment

In recent years, education levels have improved in Bangladesh, especially the ratio of children completing primary education, which went from 57% in 2008 to 75% in 2011[12]. However, literacy rates are still quite low — 55% for females and 62% for males. Among the youth demographic, literacy is better (around 80%), but unemployment rates are nearly double compared to the national average (see Figure 8).
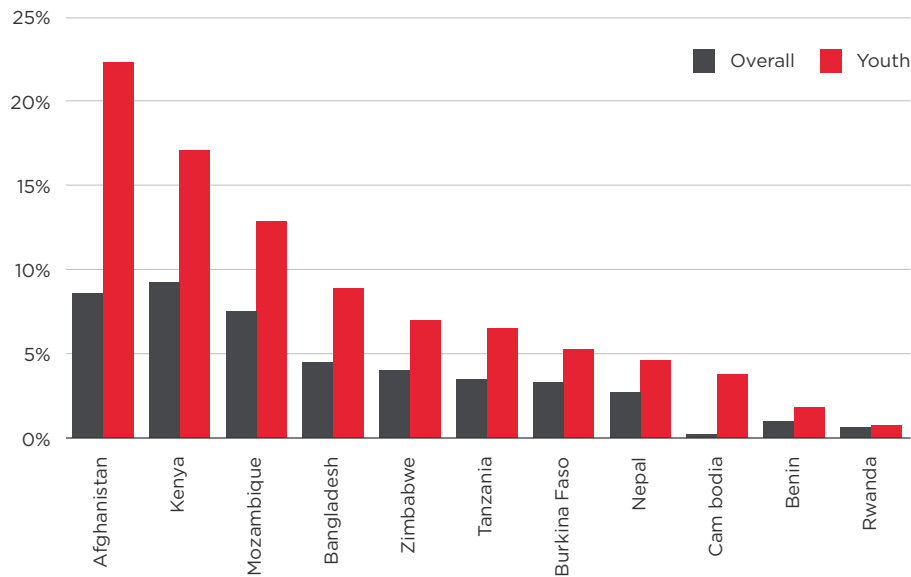

Figure 8: Unemployment rates
Source: ILO, World Bank

The main challenges Bangladeshis face when looking for a job are lack of skills and information[13] — most job searches are informal (word of mouth) rather than formal (such newspapers or magazines). Mobile phones and computers are not used frequently when looking for a job. However, Bangladeshis have shown a willingness to use their mobile to access training and to pay for job search and job matching information if delivered via phone: the preferred communication method is over voice calls rather than SMS (see *Value of voice — an unsung opportunity*). Younger generations have shown willingness to pay for employment related services for three main reasons: they can use the service when they like, they don't have to travel to use this service and this would be the only way they would have access to this service. The market is significant — we estimate 6.5 million youth will have access to mobile employment services by 2018[13].

From a business model perspective, we expect most of the opportunity to be B2C. Planned services are collaborative efforts, with one targeting a mobile service for women entrepreneurs in Bangladesh by providing information on starting a business and accessing finance, and another a partnership between BRAC, Robi and the British Council to launch a mobile education service to help adolescent girls develop English skills to improve their employment prospects. Mobile operator interest is evident in both of these, and we would

[12] Source: World Bank
[13] Source: Mobile Services for Youth Employment, GSMA/Alcatel-Lucent, July 2013

expect that to continue over the next 2–3 years given the size of the target market and the favourable trust perceptions held of mobile operators in this space. The monetisation question is challenging in that there is little precedent for paid-for services in this area. Clever thinking in tariffs — such as by bundling in employment VAS with connectivity services — would help, as would more concerted marketing efforts because services in this area carry a specific demographic bent. However, demand is likely to grow both as a result of more university graduates seeking work and a greater proportion of these having the digital literacy skills that make the use of mobile an attractive option (ICT education has been made compulsory since 2013 at the secondary level under the Digital Bangladesh vision, with an equivalent target at the primary level for 2021).

Investment in innovation

While there are clear market opportunities for driving scalable VAS that have both a commercial and social impact, it is important to link the discussion back to the 'who'. In Bangladesh, one proxy for its growing maturity is the increased involvement of mobile operators in delivering M4D services. The country is well ahead of others on this measure (see Figure 9), and while operators have identified challenges in continuing to invest in this space (notably regulatory boundaries and a lack of innovation with clear business models), we expect these to be gradually overcome over the next 2–3 years. Where operators are not in a leadership position, NGOs are increasingly filling the gap, especially in the health, agriculture and learning sectors. For example, BRAC launched the innovation fund challenge for entrepreneurs focused on mobile money to improve its existing programs and establish new ones with the objective of increasing the adoption of digital financial services in the country.
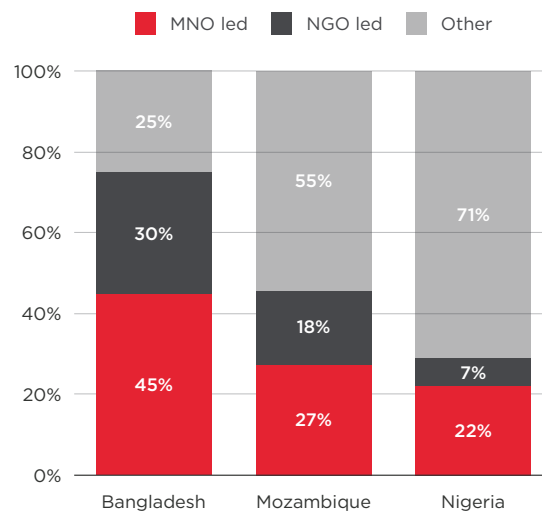

Figure 9: Stakeholder involvement in products and services
Source: GSMA M4D Impact

This is a positive story given that seed capital is a necessary ingredient in the transition from pilot to scalable market services. However, Dhaka is not yet an innovation hub to the extent of other regional centres such as Bangalore, Colombo or (further afield) Nairobi. The relative lack of involvement is not, however, due to a lack of investable opportunities.

VCs in Bangladesh face two main challenges: a lack of exit strategies and opportunities, and regulation. The first challenge is aligned with our recent analysis on the different challenges that investors face when investing in ICT in emerging markets (see Figure 10 and *Financing innovation*). Most commonly, companies exit through an IPO or by being bought out. Neither are considered reliable options in Bangladesh, as the stock market is not vibrant and there is little practice of M&A.
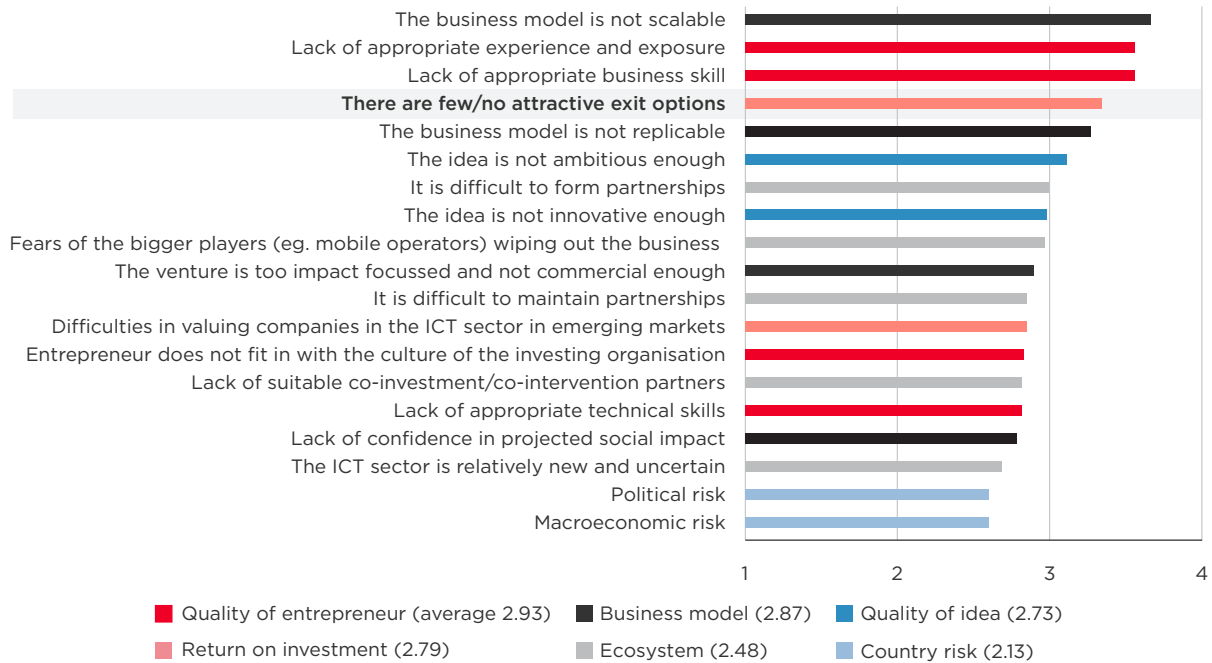

Figure 10: Risk perceptions of investors active in ICT in emerging markets
Source: GSMA M4D Impact

Note: 1 = not a relevant risk; 4 = highly relevant risk

On the regulatory front, there is no framework in Bangladesh that secures the investment of VC firms. This leads to a higher risk in investment which deters investment in the country. According to the IESE Business School study on venture capital and private equity country attractiveness index, Bangladesh ranked 80th out of 116 countries (see Figure 11), this is much lower compared to other countries in the region such as India and Pakistan which ranked 30th and 66th respectively. Bangladesh's poor score can largely be traced to issues of the market operating environment and governance (specifically investment protection and corporate governance, human and social environment, and entrepreneurial culture and deal opportunities drivers). We believe that as these challenges are tackled there is still an opportunity for other investors to be involved (currently there are a few active players such as Venture Investment Partners Bangladesh Limited (VIPB), Asian Tiger Capital Partners and the Equity & Entrepreneurship fund (EEF)).
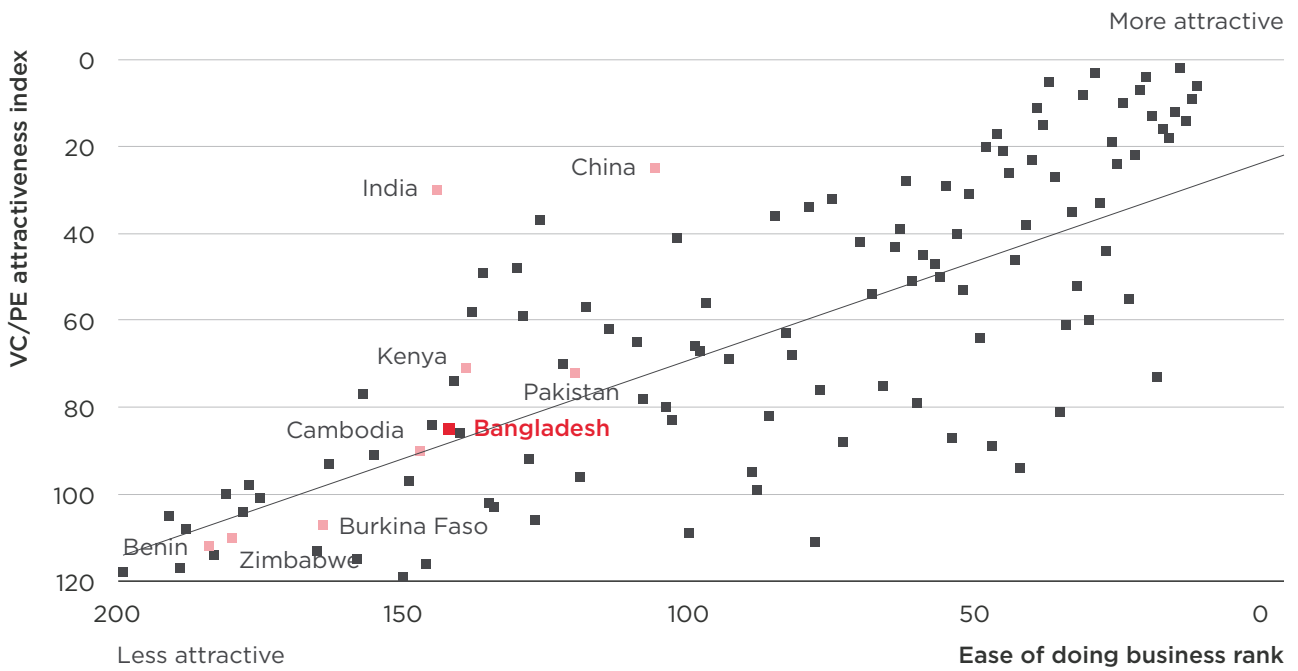
Figure 11: Ease of doing business (2014) and VC/PE country attractiveness (2013) indices
Source: IESE Business School, World Bank, IFC

Note: VC/PE country attractiveness index ranked out of 188 countries with data for 2013
Ease of doing business ranked out of 189 countries with data for 2014
Lower scores are more attractive

At an innovation level, the government is planning to create hi-tech parks to create a suitable business environment for technology industries, with the Ministry of Science and Information & Communication Technology (MOSICT) having now established an ICT incubator to develop the ICT sector in Bangladesh. All of these are positive signs and indicative of the conviction behind fostering an enabling environment for sustainable innovation in ICT. We therefore believe efforts should be focused on mitigating concerns on the market operating environment, particularly those around investment protection, promoting the free flow of capital and exit opportunities on the public markets.

The mobile market

Metric	2011	2012	2013	2014
Connections (million)	85.7	97.6	114.3	125.1
% active	100%	100%	100%	100%
% prepaid	97%	97%	97%	97%
SIMs per subscriber	1.65	1.70	1.81	1.86
Unique subscribers (million)	51.7	57.2	62.9	67.1
Penetration, connections	56%	63%	73%	78%
Penetration, unique subscribers	34%	37%	40%	42%
Connections growth (annual)	25%	14%	17%	9%
Unique subscriber growth (annual)	16%	11%	10%	7%
ARPU, by connection ($)	$2.40	$2.27	$2.01	-
ARPU, by subscriber ($)	$3.85	$3.81	$3.55	-
Recurring revenue ($, million)	$2,221	$2,493	$2,556	-
Recurring revenue growth (annual)	18%	12%	3%	-

Table 3: Bangladesh, key mobile indicators
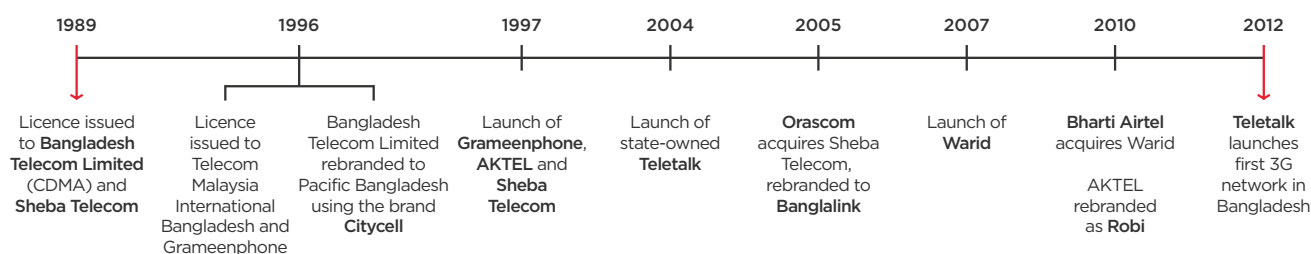*Source: GSMA Intelligence*

Figure 12: Mobile network operator launch timeline
Source: GSMA Intelligence

Low disposable income, but relatively high mobile penetration with room for further growth

Bangladesh is a low-income country, with a GNI per capita of $900 (we are using GNI per capita as income levels are based on it), however, it is the tenth largest market worldwide in terms of unique mobile subscribers. Based on the global mobile penetration average of the different income levels, Bangladesh has a higher mobile penetration compared to the low and lower-middle income economies (see Figure 13). The number of mobile phone users in Bangladesh has grown rapidly; in 2003 subscriber penetration was only 1%, and in ten years this grew to 40%. It is expected to grow to 50% by 2020. There is still significant room for growth as more than 40 million adults still do not subscribe to mobile services.
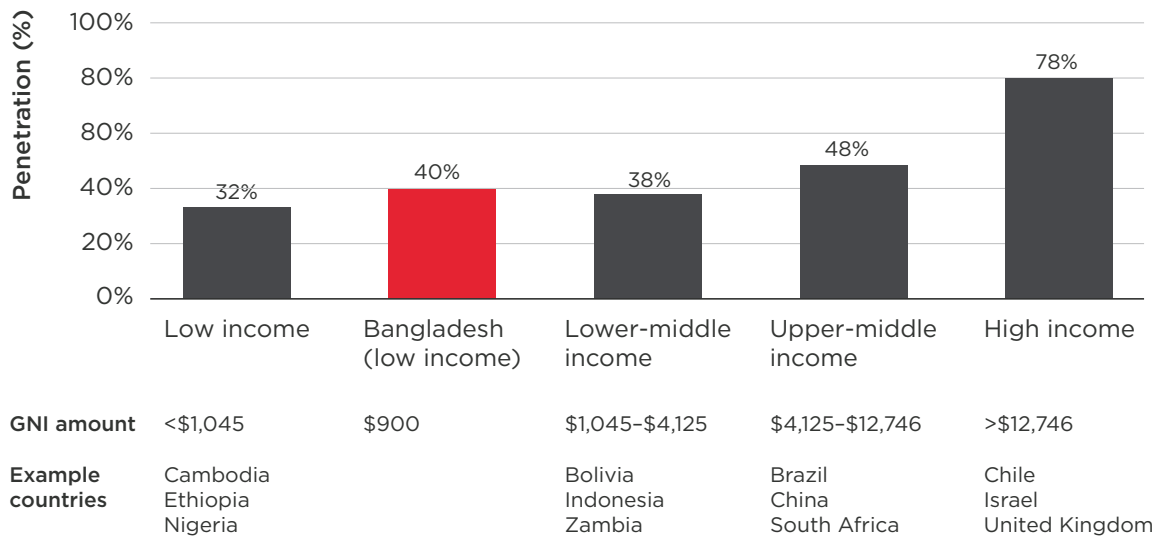
	Low income	Bangladesh (low income)	Lower-middle income	Upper-middle income	High income
GNI amount	<$1,045	$900	$1,045–$4,125	$4,125–$12,746	>$12,746
Example countries	Cambodia Ethiopia Nigeria		Bolivia Indonesia Zambia	Brazil China South Africa	Chile Israel United Kingdom

Figure 13: Average mobile subscriber penetration by income level, globally

Source: GSMA Intelligence

One of the reasons behind Bangladesh's high mobile penetration rate is due to the impact of the Grameenphone Village Phone programme, a pioneering initiative that, among other things, has led to the empowerment of rural women in Bangladesh. Grameen Bank provides women entrepreneurs in rural areas with credit to buy a phone from Grameenphone which is then used to provide mobile pay phone services, allowing the women to charge a markup agreed with Grameenphone. Underpinning this is the rapid roll-out of mobile infrastructure. By 2000 nearly half of the country was covered by mobile networks, and this rapidly increased to nearly the whole country by 2002 (see Figure 14). In June 2014, Grameenphone reported that 2G coverage was 99.17% by population and 89.50% by area[14] and that all 64 of the country's district headquarter cities are covered by its 3G network[15]. In this regard, Bangladesh is significantly ahead of countries within its region or level of development (see Figure 15).

[14] Source: *Q2 2014 Business Highlights*, Grameenphone, 2014
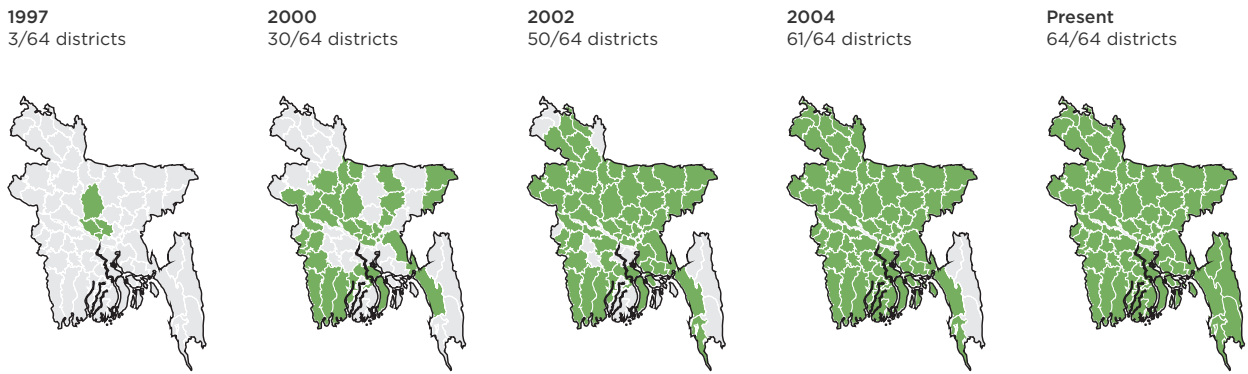[15] Source: *Grameenphone 3G reaches all 64 district headquarters*, TeleGeography, April 2014

1997
3/64 districts

2000
30/64 districts

2002
50/64 districts

2004
61/64 districts

Present
64/64 districts

Figure 14: Mobile coverage evolution

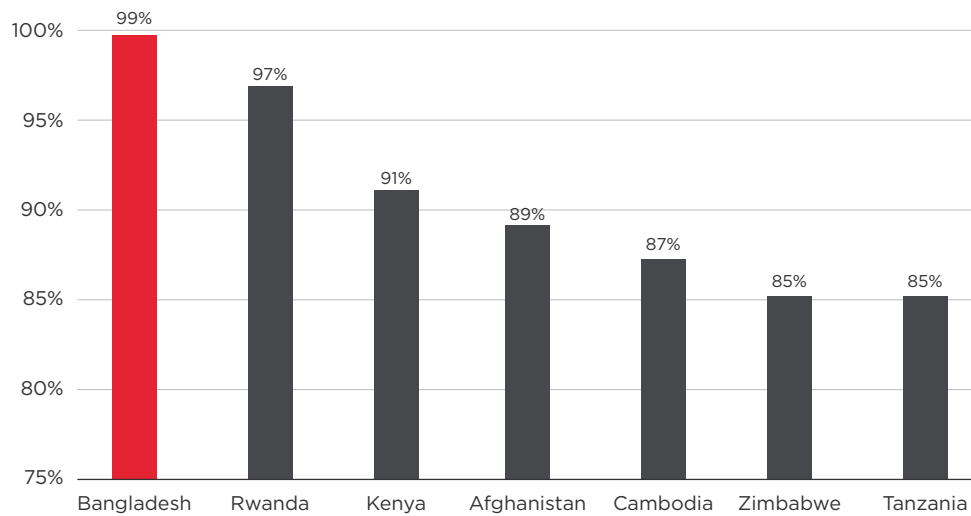*Source: Association of Mobile Telecom Operators of Bangladesh (AMTOB)*

Figure 15: 2G population coverage[16]

Source: GSMA Intelligence

In deploying network infrastructure, operators have needed to extend their coverage to rural areas with limited access to the grid. Operators need to find an alternative energy solution to reduce their dependency on diesel generators (DG) to power up their base stations, as this leads to a significant increase in operational expenses (opex). By depending on a DG solution, operators spend 65% of their opex on diesel for off-grid sites. Operators can implement a green technology solution for 3,622 problematic sites and claim some savings; in 2012 there were only 171 green-power sites. GSMA Green Power for Mobile (GPM) has estimated that for the problematic sites, operators could save around $41 million in opex with total investment of up to $100 million in 2012. This can increase to a $90 million saving per year by 2015 with an investment of $184 million for 6,660 problematic sites[17].

[16] For most countries the figure represents the coverage of the largest operator

[17] Source: *Extending the Grid: Bangladesh Market Analysis*, GSMA, 2013

Since 2007 there have been six mobile operators in Bangladesh[18]. Grameenphone is the dominant operator, with a 41% market share at the end of 2013 (see Figure 16). Bangladesh has a relatively competitive market which has had a clear consumer benefit in terms of falling mobile phone prices; the effective price per minute has fallen from $0.12 in 2002 to $0.01 today which in turn has led to Bangladesh enjoying a lower cost of ownership as a share of income compared to its peer countries (see Figure 17 and 18).
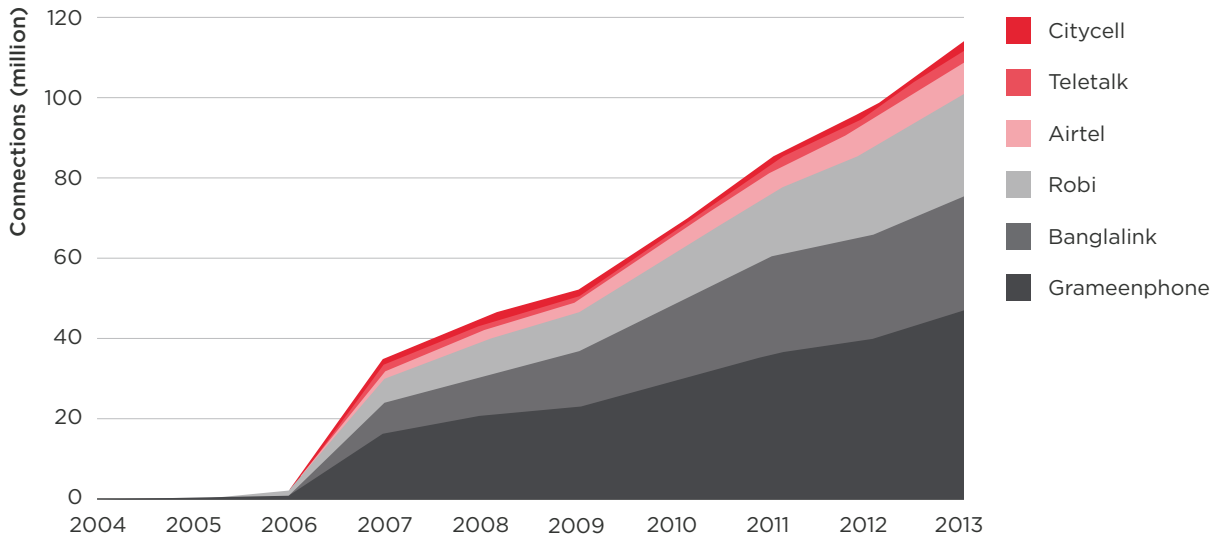

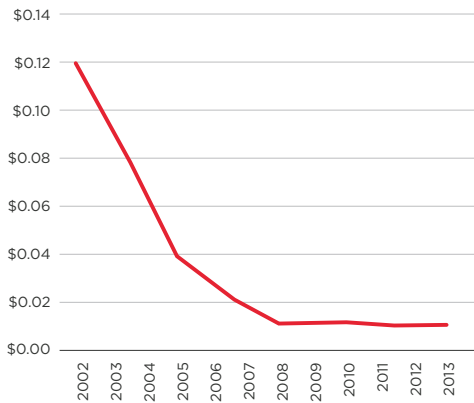**Figure 16:** Operator market share evolution
Source: GSMA Intelligence

Figure 17: Effective price per minute ($)
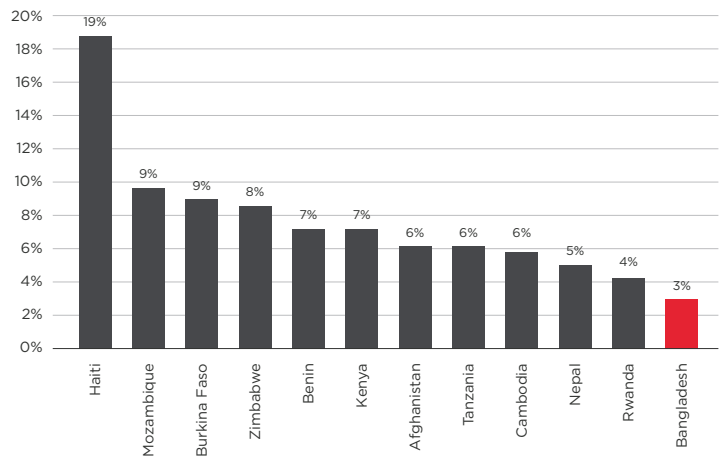*Source: GSMA Intelligence*

Figure 18: Airtime cost (ARPU) as a share of income, 2013
Source: GSMA Intelligence, World Bank

Bangladesh has one of the lowest average revenue per user (ARPU) levels in the world; however this has not always been the case. In 2001, ARPU was nearly $30 and declined to $2 in 2013. Over the same period the prepaid subscriber base grew from 62% of connections in 2001 to 97% today. While contract ARPU is still 3–4 times higher than prepaid ARPU in

[18] There are other two operators Qubee and Banglalion Communications with WiMAX licences and a market share of less than 1%

Bangladesh, this change in the prepaid mix is the dominant factor for the decline in blended ARPU (see Figure 19). Another reason for the declining ARPU is a mix effect from new subscribers that are low income. Finally, adverse regulation surrounding the introduction of per 10 second billing on voice calls (as opposed to per minute) have impacted ARPU growth. This decline in ARPU has had a negative effect on mobile service revenue growth which now sits at 3% per year. Another factor has been the decline in subscriber growth; in 2012 the Bangladesh Telecommunication Regulatory Commission (BTRC) deactivated over one million VoIP customers from Banglalink's subscriber base and cut incoming voice call termination rates by 50% to fight the illegal calls market, placing pressure on revenue growth.
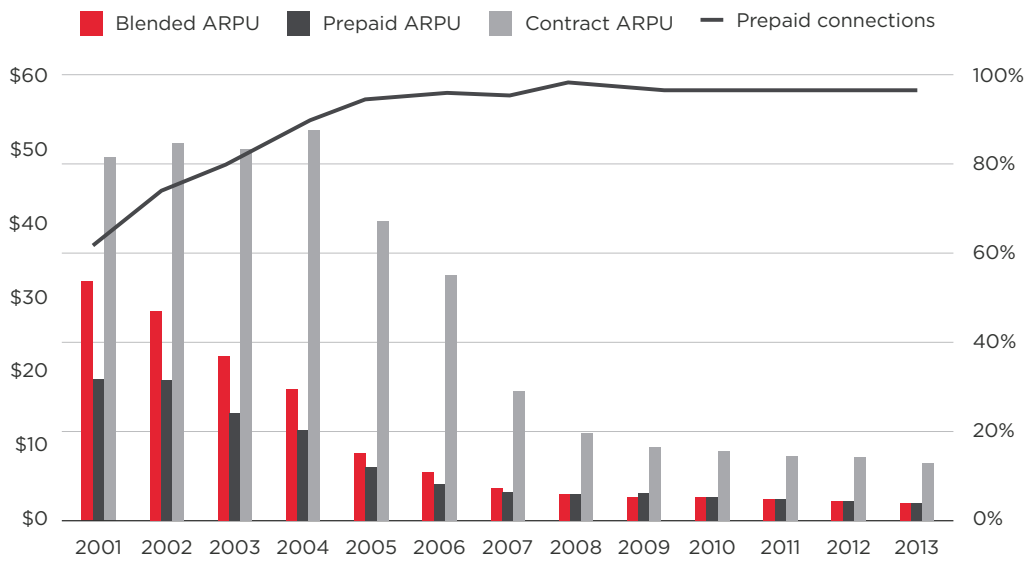

Figure 19: ARPU evolution
Source: GSMA Intelligence

Bangladesh is still a market dominated by voice. In 2013, on average, 94% of Grameenphone's recurring revenue was generated via voice services. This is one of the highest rates in the world, compared with an average of 85% in Zimbabwe, 64% in Kenya and 60% in the US, Europe and Asia. Of non-voice revenue, VAS account for only 3% of operators' recurring revenue. In addition, we expect ARPU to continue to decline as a majority of new subscribers will continue to be low income prepaid rural customers. This underlines the need to mitigate this by developing new revenue streams. We believe the opportunity is in data and VAS.

The mobile internet is on 2G

Bangladesh is a prepaid and 2G market; at the end of 2013 97% of connections were prepaid and 98% of connections were on 2G. 3G licences were only awarded at the end of 2013 after a series of delays from the regulator. As such, Bangladesh is one of the last countries in Asia to be awarded 3G licences (see *Bangladesh: Asia's untapped mobile broadband opportunity*). However, the top four mobile operators have been offering data services on 2G networks. Hence, while 3G penetration is low, mobile internet connection penetration is over 20% (see Figure 20). For example, in Q2 2014, Grameenphone reported that five million active Facebook users were on its network. The uptake of 3G connections is expected to be relatively fast; by 2020 we forecast 3G connections will surpass 2G, even if this is slower than the regional average.
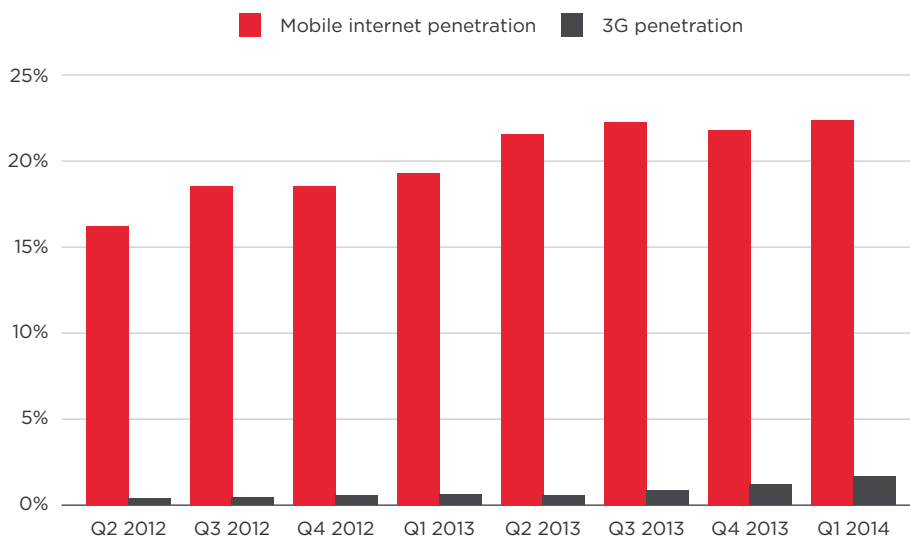

Figure 20: Mobile internet connections[19] vs 3G penetration
Source: GSMA Intelligence, BTRC

In the first half of 2013 smartphones accounted for 6% of total handset shipments into Bangladesh, which has steadily increased but is still very low (see Figure 21). The largest vendor in Bangladesh is a local brand, Symphony Mobile, with a 37% handset market share, of which 34% accounts for feature phones and 3% for smartphones (see Figure 22). In just five years, Symphony Mobile has out-powered international giants like Nokia and Samsung. Nokia dominated the Bangladesh handset market for around a decade with a 50%+ handset market share annually until the end of 2010, slipping under 50% in 2011, and was surpassed by Symphony Mobile in 2012. Symphony Mobile's unique offerings and first-mover advantage have given the firm a distinct competitive edge; for example they were the first to launch dual-SIM handsets and the country's first phone with QWERTY keyboard and trackball. Another selling point is given by their pricing structure, handset prices start from BDT 1,000 ($13) and go up to BDT 20,000 ($250). In addition, their smartphones run on Android, which is the most popular operating system in Bangladesh. Lastly, Symphony Mobile has established customer care centres in all major districts and collection points in the smaller districts to ensure service to customers based in remote areas.

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[19] Figures for mobile internet represent the number of connections using the internet over the last 90 days
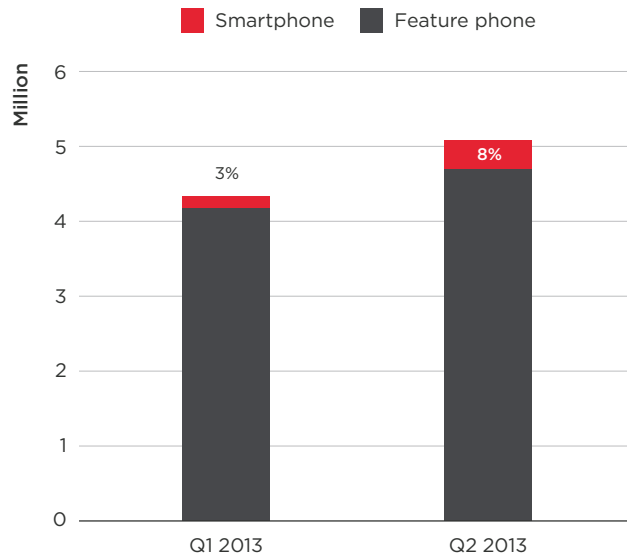
Figure 21: Feature phone vs smartphone shipments, H1 2013
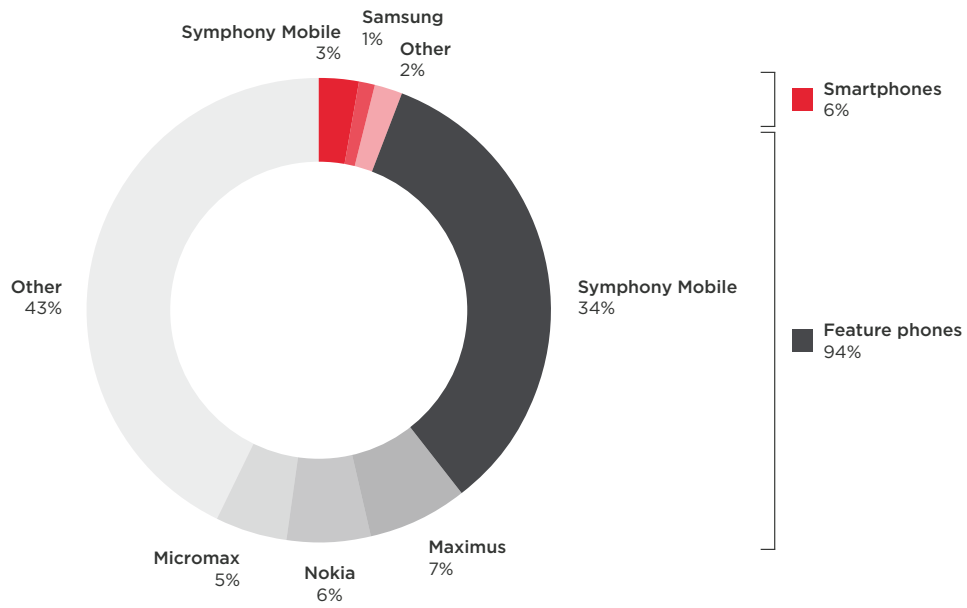*Source: CMR India*

Figure 22: Handset sales share, H1 2013
Source: GSMA Intelligence, CMR India

Regulation

The current regulatory framework in Bangladesh is based on the National Telecommunications Policy White Paper from 1998 and the Telecoms Regulating Act of 2001. The 2001 act laid out the framework for an independent regulator (BTRC) as well as a broad framework for operator licensing and spectrum management. The act was amended in 2010 to remove BTRC's power to set tariffs and issue licences without central government approval. In addition, various sanctions were imposed with regards to licence violations. VoIP services were also legalised and provisions for a universal service fund (USF) made.

In 2012, the government commissioned an expert from the ITU to look at reforming the legislative and policy framework, with nine main recommendations, of which the most relevant are to: determine presence of market dominance and need for regulation to promote competition; introduce a market-based spectrum allocation, trading and sharing process; and review taxation policy.

Yet there has been no formal adoption of the draft policy proposed in 2012. There has been some progress in implementing a few recommendations, but in other areas things have actually worsened such as mobile number portability (MNP; a BTRC Directive was issued to operators to provide this service for ~$1 per request in mid-2013, with a deadline of January 2014 to comply, yet this deadline was not met for technical reasons) and infrastructure sharing (the regulator looks set to approve the country's first mobile network infrastructure agreement between Teletalk and Airtel, however, there is no evidence that fixed/mobile infrastructure sharing is currently occurring). In May 2014, the current minister of telecommunications stated that the telecom policy will be revised with all operators calling for a review such that policy reflects evolving technology, particularly in mobile.

The Bangladesh mobile market faces two main regulatory challenges: spectrum and taxation. The amount of spectrum assigned to operators in Bangladesh is low compared to developed markets (see Table 4). In addition, an auction for 3G spectrum was only held in September 2013 after a series of delays from the regulator. BTRC does not yet have a long-term strategy and roadmap in place for the allocation and planning of spectrum, making it difficult for operators to plan future deployments. In licensing, there appears to be a different treatment to different licensees; BTRC issued WiMAX licences without any competitive auction, despite strong opposition from operators and denying a high court ruling.

Frequency (MHz)	800	850 (CDMA)	900	1800	2G 3G 2100	DD[20] 700	WiMAX/LTE 2300 (TDD)	2500 (TDD)	2600
Grameenphone	-	-	2 × 7.4	2 × 14.6	2 × 10	-	-	-	-
Banglalink	-	-	2 × 5	2 × 10	2 × 5	-	-	-	-
Robi	-	-	2 × 7.4	2 × 7.4	2 × 5	-	-	-	-
Airtel	-	-	2 × 5	2 × 10	2 × 5	-	10	-	-
TeleTalk	-	-	2 × 5.2	2 × 10	2 × 10	-	-	-	-
Citycell	-	2 × 8.82	-	-	-	-	-	-	-
Qubee	-	-	-	-	-	-	35	-	-
Banglalion	-	-	-	-	-	-	-	35	-
Olli	2 × 10	-	-	-	-	-	-	-	-
Always On	-	-	-	-	-	2 × 6	-	-	-
Other	-	2 × 5.04	0	2 × 7.5	0	0	20	-	-
Vacant	2 × 5	2 × 2.86	0	2 × 15.5	2 × 44.34	2 × 36	35	15	2 × 70
Total	2 × 15	2 × 16.72	2 × 30	2 × 75	2 × 54.34	2 × 42	100	50	2 × 70

Table 4: Spectrum portfolio, Bangladesh
Source: GSMA Intelligence

In addition, Bangladesh has one of the highest taxation rates for mobile services in the world, with operators paying tax at nearly 60% of revenue, this has been increasing since 2008 at an annual rate of 8%. Just over 70% of mobile services taxes are sector-specific taxes (i.e. corporate taxes that are only paid by companies within the mobile sector), which is higher than the estimated average of 40%[21]. In addition to these taxes, the finance minister has proposed an additional 15% value added tax (VAT) on the import of mobile handsets; this could lead to a further illegal import of mobile phones. Another tax that has been a longstanding issue in Bangladesh is the tax on SIM cards and SIM replacements. The industry has been keen on removing the BDT 300 ($3.90) tax on SIM cards and the BDT 100 ($1.30) tax on SIM replacement given the risk that the tax hike could reduce SIM sales and cut growth in the sector.

All these taxes and regulations will impact the growth of investments and quality of services; in the current situation operators will not be able to continue offering services at the current rates. This will impede the growth of the industry and the competition to get new subscribers — especially from the bottom of the pyramid.

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[20] Digital dividend
[21] Source: *Mobile Taxes and Fees - A Toolkit of Principles and Evidence*, GSMA/Deloitte, 2014

Appendix

Benchmarking Bangladesh: methodology

Figure 23: Benchmarked countries
Source: GSMA Intelligence

For the purpose of this report we have chosen a selection of 11 other benchmark countries to compare to Bangladesh (from a total 236 countries world-wide). The selection of countries has been made on the following four criteria:
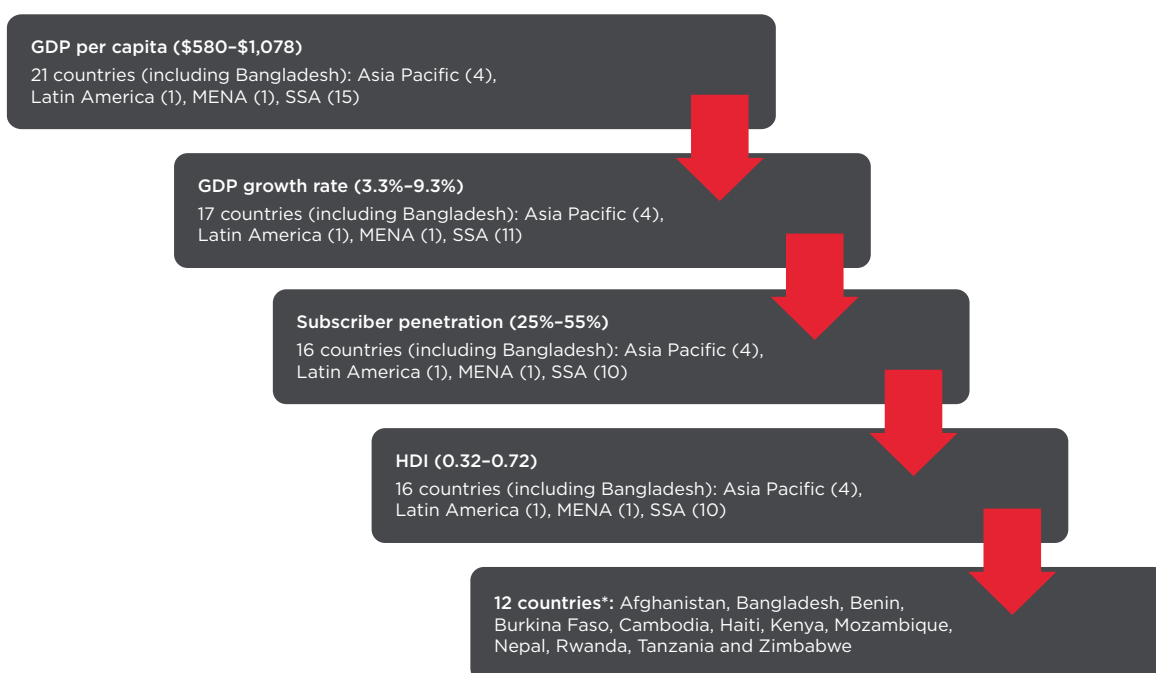
1. **Wealth** — GDP per capita (2013)
2. **Economic growth** — GDP growth rate (2010–13)
3. **Mobile market maturity** — subscriber penetration (Q4 2013)
4. **Human development** — Human Development Index – (HDI, 2012)

Taking Bangladesh as the base we have selected countries which fall under a variance range chosen for each of the four criteria. Table 5 shows the range of variances chosen to arrive at a group of countries which represent major regions across the globe.

Criteria	Variance	Lower value	Nigeria	Higher value
GDP per capita ($)	± 30%	$580	$829	$1,078
GDP growth rate (%)	± 3pp	3.3%	6.3%	9.3%
Subscriber penetration (%)	~± 15pp	25%	40%	55%
HDI (1 is the highest)	± 0.2	0.32	0.52	0.72

Table 5: Benchmarking criteria
Source: GSMA Intelligence

GDP per capita ($580–$1,078)
21 countries (including Bangladesh): Asia Pacific (4),
Latin America (1), MENA (1), SSA (15)

GDP growth rate (3.3%–9.3%)
17 countries (including Bangladesh): Asia Pacific (4),
Latin America (1), MENA (1), SSA (11)

Subscriber penetration (25%–55%)
16 countries (including Bangladesh): Asia Pacific (4),
Latin America (1), MENA (1), SSA (10)

HDI (0.32–0.72)
16 countries (including Bangladesh): Asia Pacific (4),
Latin America (1), MENA (1), SSA (10)

12 countries*: Afghanistan, Bangladesh, Benin,
Burkina Faso, Cambodia, Haiti, Kenya, Mozambique,
Nepal, Rwanda, Tanzania and Zimbabwe

* Four countries (Lesotho, Mauritania, Tajikistan and Togo) filtered owing to very low population

Country	Sub region	GDP per capita ($)	GDP growth rate (%)	Subscriber penetration (%)	HDI	Population (million)
Afghanistan	South Asia	$678	8.2%	37.7%	0.374	30
Bangladesh	South Asia	$829	6.3%	39.9%	0.515	156
Benin	Africa	$805	4.8%	42.8%	0.436	10
Burkina Faso	Africa	$684	6.8%	31.6%	0.343	17
Cambodia	East Asia/Pacific	$1,008	7.3%	50.8%	0.543	15
Haiti	Latin America	$820	4.2%	39.8%	0.456	10
Kenya	Africa	$994	4.6%	39.8%	0.519	44
Mozambique	Africa	$593	7.3%	25.0%	0.327	26
Nepal	South Asia	$694	4.0%	36.5%	0.463	28
Rwanda	Africa	$633	6.9%	30.3%	0.434	12
Tanzania	Africa	$695	6.8%	29.8%	0.476	49
Zimbabwe	Africa	$905	5.6%	47.2%	0.397	14

Table 6: Data used for benchmarking
Source: GSMA Intelligence, World Bank

Whilst 16 countries show similar profiles after applying the four benchmarking criteria, we saw that four of these have very low population (less than 10 million) when compared

to Bangladesh which has around 155 million inhabitants. We therefore filtered these out leaving us with 12 countries including Bangladesh along with Afghanistan, Benin, Burkina Faso, Cambodia, Haiti, Kenya, Mozambique, Nepal, Rwanda, Tanzania and Zimbabwe.

Note that while we have benchmarked Bangladesh against these peers for the purposes of aligning markets at similar stages of development, we also provide regional comparisons at relevant points in the report to group markets influenced by similar regulatory climates and spectrum plans.

Country environment

Relevant groups and organisations

Government bodies and trade associations	• Bangladesh Telecom Regulatory Commission • Association of Mobile Telecom Operators of Bangladesh

Data: regulation, business environment, demographics and economics

2014	Bangladesh	Kenya	Mozambique	Nepal	Tanzania
ICT regulation (1 = nonexistent, 7 = well developed)	3.0	4.1	2.9	2.7	3.2
Government emphasis on ICT (1 = weak priority, 7 = high priority)	4.1	4.7	3.4	2.9	3.7

Table 7: Government and regulation
Source: Global IT Report 2014, World Economic Forum

2014	Bangladesh	Kenya	Mozambique	Nepal	Tanzania
Venture capital availability (1 = very difficult; 7 = very easy)	2.0	3.0	2.1	2.3	2.6
Impact of ICT on new products, services & business models (1=not at all; 7 = significantly)	3.8	4.8	3.6	3.5	3.9
Impact of ICT on access to basic services (1 = do not enable access at all, 7 = enable access)	3.7	4.3	3.3	3.3	3.4
Ease of doing business rank	130	129	139	105	145
Business entry density rate[22]	0.1	0.9	-	-	-
Number of days to start a business	10.5	32	13	17	26
Corruption perception index (0 = highly corrupt, 100 = highly clean)[23]	27	27	30	31	33

Table 8: Business environment and entrepreneurship
Source: Global IT Report 2014, World Economic Forum, Transparency International, World Bank

[22] Data for 2012
[23] Data for 2013

Topic	2014 rank	2013 rank	Change	
Overall ranking	130	132	2	⬆
Starting a business	74	83	9	⬆
Dealing with construction permits	93	80	-13	⬇
Getting electricity	189	189	-	
Registering property	177	177	-	
Getting credit	86	82	-4	⬇
Protecting investors	22	21	-1	⬇
Paying taxes	100	98	-2	⬇
Trading across borders	130	126	-4	⬇
Enforcing contracts	185	185	-	
Resolving insolvency	119	121	2	⬆

Table 9: Ease of doing business, by topic
Source: World Bank Ease of Doing Business Rankings

2013	Bangla-desh	Kenya	Mozam-bique	Nepal	Tanzania	South Asia
Population (million)	158	45	26	28	50	1,760
Urban population	29%	25%	32%	18%	28%	33%
Literacy rate[22]	59%	72%	51%	57%	68%	70%
Median age (years)[24]	24.3	19.1	16.9	22.9	17.4	26.2
Mobile penetration, connections	73%	70%	48%	77%	54%	74%
Mobile penetration, subscribers	40%	40%	25%	37%	34%	34%

Table 10: Demographic data
Source: GSMA Intelligence, World Bank

[24] Data for 2014

2013	Bangla-desh	Kenya	Mozam-bique	Nepal	Tanzania	South Asia
GDP growth	6.0%	4.7%	7.1%	3.8%	7.0%	3.7%
FDI (% of GDP)[22]	1.1%	0.6%	36.4%	0.5%	6.0%	1.2%
Unemployment[22]	4.5%	9.2%	7.5%	2.7%	3.5%	4.1%
Inflation	7.5%	5.7%	4.2%	9.0%	7.9%	10.9%

Table 11: Economic data

Source: World Bank, IMF, GSMA Intelligence

Glossary

ICT regulation
How would you assess your country's laws relating to the use of information and communication technologies (e.g., electronic commerce, digital signatures, consumer protection)? Key: 1 = nonexistent; 7 = well developed, 2010–2011 weighted average.

Government emphasis on ICT
How much priority does the government in your country place on information and communication technologies? Key: 1 = weak priority; 7 = high priority, 2010–2011 weighted average.

Venture capital availability
In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital? Key: 1 = very difficult; 7 = very easy, 2010–11 weighted average.

Impact of ICT on new products, services and business models
To what extent are information and communication technologies creating new business models, services, and products in your country? Key: 1=not at all; 7 = significantly, 2010–2011 weighted average.

Impact of ICT on access to basic services
To what extent are information and communication technologies enabling access for all citizens to basic services (health, education, financial services, etc.) in your country? Key: 1 = do not enable access at all, 7 = enable access significantly, 2010–2011 weighted average.

Business entry density rate
Recurring (service) revenue generated in the period, including revenue generated from the use of the network (voice, messaging, data, VAS), but excluding non-recurring revenue such as handset or equipment revenue.

Unique subscribers
Total unique users who have subscribed to mobile services at the end of the period, *excluding* M2M. Subscribers differ from connections such that a unique user can have multiple connections.

Mobile penetration, subscribers
Total subscribers at the end of the period, expressed as a percentage share of the total market population.

ARPU, by subscriber
Average revenue per user (ARPU). Total recurring (service) revenue generated per unique subscriber per month in the period. Different from ARPU by connection, ARPU by subscriber is a measure of each unique user's spend.

Mobile termination rate (MTR)
Charges which one mobile operator charges to another for terminating calls on its network

About GSMA Intelligence

GSMA Intelligence is the definitive source of mobile operator data, analysis and forecasts, delivering the most accurate and complete set of industry metrics available.

Relied on by a customer base of over 800 of the world's leading mobile operators, device vendors, equipment manufacturers and financial and consultancy firms, the data set is the most scrutinised in the industry.

With over 22 million individual data points (updated daily), the service provides coverage of the performance of all 1,140 operators and 1,153 MVNOs across 3,505 networks, 65 groups and 236 countries worldwide.

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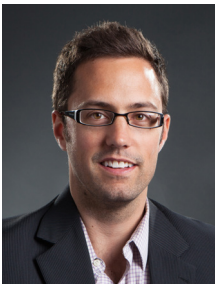
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