

The Tiny Engine of Growth: The Powerful Effect of Mobile Phones on African Development in term of Economy, Health Care, Education, Public Safety and Politics



In a rural South Africa area, William Pedro, a middle aged man who deals in farm and garden plants, tried for years to sell his plants in a rundown township near George, a resort town on South Africa's southern coast, with no success. However, when he got a cellphone two years period ago, his business took off. In fact, he did a lot better in this two year than in the eight years he had been trying previously. The reason why his plants wouldn't sell before he acquired a phone is that white people were afraid to come to his place in the township to buy plants. Since he acquired his phone, his customers could call him for orders and he could deliver his plants on the same day. (Lafraniere)

Miles and miles away from the Big Apple and other highly developed urban centers, numerous people rely on their communication device- the mobile phone. The mobile phone is commonly used as an entertainment and communication tool in the first world or even the second world. However, phones have an entirely different role in Africa. Two thirds of Africans own a phone. These people count on their phones for their lives. In general, these phones are mostly feature phones, not smartphones. Eighty-eight percent of the phones in Africa are feature phones and most of the software and services discussed below are designed for feature phones. (Sahota)

When mobile phones were first introduced to Africa, they quickly came into wide use. In 1998, there were fewer than four million mobiles on the continent. Today, there are more than 649 million. In Uganda alone, 10 million people, or about 30% of the population, own a mobile phone, and that number is growing rapidly every year. "For Ugandans, these ubiquitous devices are more than just a handy way of communicating on the fly: they are a way of life" (Fox).

In addition, there are now more mobile phones in the whole of Africa than there are in the US (Parr).

Even though it is hard for many westerners to connect advanced technology with Africa, Africa is the centre of a mobile revolution. In western society, we have just now begun adapting smartphones to be more like our computers; smartphones are coming to be viewed as a computer in your pocket. However, in Africa, where a billion people use only 4% of the world's electricity, people can't necessarily afford to charge computers or they simply can't afford expensive computers (Fox). Due to these reasons, mobile phone users and developers became more resourceful and African mobiles have been being used for quite some time to do things that the developed world is only now beginning to pick up on.

Statistically, a study by London Business School demonstrates that mobile phones have a dramatic impact on the economy in Africa: "For every 10 additional mobiles per 100 Africans, GDP rises 0.6% to 1.2%" (Perry). Mobiles are currently transforming Africa positively. Moreover, Africa is the fastest-growing cell phone market in the world, use having increased at a rate of 20 per cent per year since 2007, with a total market of nearly 649 million users in 2011(Myslewski). Africa is the second-largest market for mobile phones in the world after Asia (Seckan).

However, despite all the benefits that Africa has gained from mobiles, some people blame phones for raising the rate of political violence. Practically, they have made it easier for perpetrators easier to organize violent conflict with each other. In fact, studies have shown that high-conflict zones often overlap with areas of mobile connectivity. "Even when the researchers controlled for

variables like population size, sectarianism and GDP-per-capita, they found evidence suggesting that mobile phones enhanced the coordinative capabilities of opposition groups, insurgents and other rebels”(Fortin).

According to a report published in the American Political Science Review, cell phone technology can increase the ability of rebel groups to overcome collective action problems. In particular, cell phones lead to a boost in the capacity of rebels to communicate and monitor in-group behavior, thus increasing in-group cooperation. Furthermore, cell phones allow for coordination of insurgent activity across geographically distant locations. (American Political Science Review)

While phones in the first world are often used as tools to kill time before the subway arrives, phones in Africa are critical tools for development. The phone is making a significant impact in Africa in both good and bad ways. It is impacting the economy, healthcare, education, public safety and politics. It is certainly would have been hard for us to anticipate 20 years ago that such a small device could bring this massive impact to this continent. Currently, mobile phones are having a huge impact in Africa; this positive influence will potentially minimize the economic gap between developed nation and Africa.

Economic Benefits

The African economy has been struggling a lot for centuries due to colonization from Europeans in the past. However, the African economy has received a dramatic boost due to the presence of mobile phone. Mobile phone boost the African economy in numerous way, such as communication ability, mobile banking, agriculture and the generation of job opportunities.

One woman living on the Congo River illustrates perfectly the dramatic impact phones have on the developing economy of Africa while she is unable to write her last name, she can tell her customers to call her cellphone if they want to buy the fresh fish she sells. In fact, she doesn't even have electricity, which

means she can't freeze the fish that she catches. Therefore, she keeps her fish in the river, tethered live on a string, until a call comes in. (LaFRANIERE)

While people in the first world use their phone for gaming or social media, Africa use the mobile phone as more than just an entertainment or communication devices. They also use this tiny device as a virtual bank. There is a mobile banking system call M-PESA that is viewed as the world's most advanced mobile banking system.

M-PESA is a mobile money transfer service launched by Safaricom, Kenya's largest mobile operator, and Vodafone in 2007. Five years later M-PESA provides services to 15 million Kenyans, which is more than a third of the population of Kenya and serves as conduit for a fifth of the country's GDP.

(Ogunlesi)

Essentially, M-PESA allows an user with a national ID or a passport to deposit, withdraw, and transfer with their mobile device. The reason why mobile banking is so influential for Africans is that M-PESA allows users without a bank account to transfer their funds to relatives that live far away as quickly and easily as sending a text message. In addition, "Over 50% of the adult population use the service to send money to far-flung relatives, to pay for shopping, utility bills, or even a night on the tiles and taxi ride home."(Graham).

Ninety-six percent to ninety-eight percent of people own a bank account in developed world (Graham). Since people who live in rural Kenya aren't able to travel all the way to the bank and don't have any Internet access, it is inconvenient for them to get a bank account. In addition, "Internet penetration, meaning the percentage of area that has internet access, is estimated at 15.6 per cent across Africa, according to Internet World Statistics (it stands at 83.6 per

cent in the UK), but in Somalia it is just 1.2 per cent” (Parr). Even if many Africans did have a bank accounts, it wouldn’t be that feasible for them to manage the accounts due to the lack of Internet and the far distances involved. Moreover, the other reason why traditional bank accounts often don’t work for Africans is that not all Africans have a permanent address for banks to mail bills to. The requirement for creating a bank account is often to provide a permanent address. Therefore, M-PESA is the ultimate solution for Africans. M-PESA provided a simple solution for people without a bank account.

John Makusi Simiyu is a businessman who owns a transport and real estate company. M-PESA has changed the way he pay his workers. Paying wages has become a lot easier for him. Now he simply texts his employees for their payment which means he no longer needs to travel miles to the bank to make the transfer (Graham). In addition, one of the other great benefits is increased security. Mr. Makusi says he no longer has to worry about being mugged while carrying cash. “People with market stalls pay for the produce to be delivered by M-Pesa rather than carrying cash. Carrying cash in emerging markets is a very risky thing to do,” said Mr. Hughes, who is the founder of M-PESA. (Graham)

Although M-PESA isn’t the first mobile transferring system, it is probably the most successful service in the world. “In March 2010 28.59bn Kenyan Shillings (KES) (£220m, \$351m) was transferred using the service.” (Graham) In addition, M-PESA isn’t the only mobile money service in Africa. In fact, there are numerous mobile banking services throughout the continent. For instance, there are yuCash and BepaPay, cashless bus ticketing system in key regions, such as Kenya, Nigeria, Uganda and South Africa. (Mobile money services on the move in Africa)

Mobile banking is just one of the areas in which phones impact the African economy. Another area that mobiles impact is Africa's agriculture. The price for farm goods is constantly changing every minute. Therefore, the timing for a farmer to either buy or sell their crop is critical. Farmers would much rather sell their crops at the highest price and buy their seeds at the lowest price. Whenever farmers in a developed country need to either sell or buy farm products, they can simply go online with the mobile phone or laptop in order to check for the current price. Although this seems like a simple task for farmers in developed countries, it is a challenge for African farmers. Due to the lack of Internet access, African farmers can't just pull out their laptop or device and go online for crop prices, which has become one of the biggest challenges for them.

However, "As far back as 2003, Kenya's Agricultural Commodities Exchange partnered with mobile operator Safaricom to launch SokoniSMS64, a text-messaging platform to provide pricing information to farmers" (Ogunlesi). This kind of service is commonly referred to a Mobile-based Market Information System and has emerged throughout the entire continent. Services like this enable farmers to negotiate better deals with traders and improve the timing of getting their crops to market.

In addition, the newer generation mobile-based market information systems, Esoko, provides not only market prices but also the ability for farmers or traders to buy or sell crops with their mobile devices. Esoko is one of the most successful new generation services, which was developed by Ghana-based BusyLab. Originally established in 2005 as TradeNet, the company was rebranded as Esoko in 2009. It is so successful that it has attracted investment from the International Finance Corporation, the Soros Economic Development

Fund, and well-known Silicon Valley engineer Jim Forster. Currently the company has a presence in nine countries on the continent. (Maritz) With this service, African farmers and traders are able to access current crop prices and buy or sell crops without worrying about selling their crops at the wrong time or traders ripping them off by purchasing crops from them at an artificially low price.

The other service that mobile phones brought to African agriculture is the ability to distribute agricultural insurance products to farmers on their mobile phones. This is really a revolutionary service for Africans, since most African farmers can't afford conventional insurance.

A insurance product called Kilimo Salama, Swahili for 'safe agriculture', enables smallholder farmers in Kenya to insure their agricultural inputs against adverse weather conditions, such as drought or too much rain. Developed by UAP Insurance, the Syngenta Foundation for Sustainable Agriculture and mobile operator Safaricom, Kilimo Salama allows smallholder farmers to insure as little as one kilogramme of maize, seed or fertiliser. To be covered under the scheme, farmers only need to pay an extra 5% for a bag of seed, fertiliser or other inputs (MARITZ).

Products like this are distributed through agro dealers that have been equipped with camera phones that scan a special bar code at the time of purchase, which immediately registers the policy with UAP Insurance over Safaricom's mobile data network. This application will send a SMS message confirming the insurance policy to the farmer's mobile device. Payouts are determined by automated weather stations that monitor the rainfall. Based on the stations' measurements and a predefined formula of crop rainfall needs, payouts are automatically made to farmers using M-PESA. In addition, farmers don't have to fill out any claim forms and all of it can be done with a mobile phone. Moreover, there are numerous similar services in other region. As expected,

products like Kilimo Salama increase productivity since only about half of Kenyan farmers invest in improved seeds and soil inputs. A key reason for the low demand is the fear among farmers that poor conditions, such as drought, will render their investment worthless, robbing them of both their crops and their savings.

Not only mobile money and crop pricing systems help boost the economy of Africa. In fact, the most basic and fundamental feature of phones- “communication” promotes the economy in Africa as well. Numerous African’s businesses have gotten better because of this tiny device. The capability of communicating with others at long distances encourages businesses to negotiate deals on their phones. Unsurprisingly, mobile phones also speed up the way people do business. The woman selling fish from the Congo River that was mentioned above and William Pedro, who sold plants in the ragtag township are examples of this dynamic.

Moreover, the presence of mobile phone also creates numerous new types of jobs. According the latest World Bank report, mobile phones were directly associated with the creation of more than 5 million jobs in Africa last year and contributed 7 percent to Africa’s Gross Domestic Product — higher than the global average. (Lazuta)

For instance, in one rural town, an entrepreneur started his own business, which provides charging services for people’s mobiles. Due to the scarcity of electricity, it is hard for them to charge their phones in their homes or even their town. Therefore, this entrepreneur charges people to bring their phones to town to charge and then bring them back. And of course, the rise in mobile phone popularity increases the amount of jobs needed for selling phones and

maintaining the service. These are all examples of the presence of mobile phones helping Africa economically.

Health Care

Another crucial impact that mobile phones have on this continent is on health care. It is hard to imagine the relationship between phones and health care. In fact, some people in the first world might even think that mobile phones actually harm us instead. How can mobile phone promote health care? Mobile phones promote health care in Africa by disseminating health information to people, checking reliability of drugs, and collecting health information for further study.

Due to the lack of internet access in Africa, a lot of common sense relating to health or health news cannot be spread at a fast pace. Therefore, companies use text messages to distribute health-related news in Africa. For instance, there is a project in Zanzibar and Tanzania, called the Wireless Mothers Project, which uses mobile technology to provide information to mothers regarding childbirth and the prevention of child mortality (McMunn). On the other hand, other services use the text message system to prevent innocent Africans from buying fake drugs.

Since “The World Health Organization estimates that nearly 30% of drugs supplied in developing countries are fake. In 2009, nearly 100 Nigerian babies died after they were given teething medicine that contained a solvent usually found in antifreeze.”

For instance, 28-year-old Ghanaian doctoral student, Bright Simons, to tackle counterfeit medicine in African countries, created a simple text-messaging solution. Essentially, “his idea was to put unique codes within scratch cards on medicine packaging that buyers can send via SMS to a designated number to find

out if the drug is genuine or not”(Ogunlesi). In this way, no African will accidentally purchase a fake drug and die from taking it. Furthermore, the system is now being used by several countries in Africa and rolled out to places such as Asia, where there are similar problems with counterfeit drugs.

Another example of mobile phones impacting health care is using cellphone signals to track millions of people’s travel habits. A study in 2008 to 2009 tracked the travel habits of 15 million Kenyans by cellphone signal. The location data was collected from the 11,920 cell towers in the country(Communications & Biomedicine Update: Cellphones Impacting Healthcare)Then the officials used this data to correlate to incidence of malaria outbreaks, meaning they could figure how malaria started and where it started.

Education

In many countries, technology has been used as a tool to distribute educational information, yet most countries use laptops to help with education. However, many Africans can’t necessarily afford computers. Therefore, mobile phones replace computers in developing countries. Although the mobile phone seems like a tiny device that couldn’t be possibly replace the educational purpose of a laptop, Africans made it possible. There are services in Africa created for educational purposes. Mobile phones benefit Africa's education by providing educational services via phone, allowing students to receive education from a distance, and working as reading devices. For instance, MXit is Africa’s largest homegrown mobile social network. “With over 50 million users, the South Africa-founded service not only allows its mostly young users to stay in touch by text chatting, it also facilitates live tutoring on math homework. Dr Maths on MXit has helped 30,000 school-aged children work through math

problems by connecting them with math tutors for live chat sessions”(The Future of Education in Africa is Mobile).

“The service is effective for two reasons: it is cheap – the actual service is free but users pay a minimal data charge to their mobile providers – and it operates in the evenings, when learners need help with homework. For many children in South Africa, this is the most qualified tutor that they will have access to” (Vosloo).

Not only the affordability of laptops hinders African from receiving education. The shortage of trained and motivated teachers is one major issue that is obstructing African education. For instance, it is estimated that to ensure that every child has access to quality education by 2015, sub-Saharan Africa will need to recruit 350,000 new teachers every year, which is unlikely to happen. Therefore, receiving education from mobile phone is the only hope that many rural Africans have. One other reason that receiving education is hard is because of the location. People who live in rural areas can’t necessarily afford to relocate near to existing institutions.

For example, Lesego is an eighteen year old girl who lives in an isolated village in western Botswana. “She is smart and wants to study for a degree, but the nearest universities are several hundred miles away in the east of the country, and she cannot afford to relocate. Instead, she is learning remotely. She does not use a computer, because her family cannot afford one and the electricity supply is prone to frequent outages, but her newly purchased smartphone allows her access to the internet and a suite of online courses – offered by some of the most respected universities in the world – as well as the most up-to-date literature, all at very little cost”(Parr).

Mobile phones in Africa have increasingly become reading devices for Africans. Due to the lack accessibility of books or the inability to afford them, mobile devices enable African students to read whatever books they want. For example, projects such as Yoza Cellphone Stories, which offers downloads of stories and novels, has shown impressive uptake amongst young African readers

who enjoy mobile novels or 'm-novels'. "On Yoza, users not only read stories but also comment and vote on them. In its first 18 months, Yoza had 470,000 complete reads of its stories and poems, as well as 47,000 user comments"(Vosloo).

Furthermore, since 2010 a non-profit organization called Worldreader has provided school children in a number of developing countries with access to digital books through donated Kindle e-readers. "Recently, it has begun to publish the books via a mobile phone-based e-reader. The Worldreader app and its library of stories are already on 3.9 million handsets. There were active readers in Nigeria, Ethiopia and Ghana, other African country"(Vosloo).

Reading on a mobile device is different from reading printed books. Mobiles offer interactivity which physical books cannot. When reading on a phone, readers can comment on the book, ask public questions if confused or have a discussion on the book itself. Overall, numerous African students inevitably favor these services that digital books provide.

Public Safety

Moreover, mobile phones also promote disaster awareness, increase the productivity of aid delivery, and enhance refugee services. In America, when catastrophes occur, people are well-alerted through news, the internet, or social media. Therefore, people are at least be aware of the situation and are able to react to disasters. However, the Internet is what is scarce in Africa. Many Africans aren't able to react to catastrophes, simply because they aren't aware of them.

In February 2000, intense flooding left hundreds of thousands of people homeless in the African nation of Mozambique. (The world bank)

“More than a decade later, February 2012 turned out to be a turbulent month for the island nation of Madagascar with Cyclones Giovanna and Irina battering the country one after the other, impacting more than 300,000 people and causing widespread flooding, landslides and severe damage to homes and businesses” (Using Information and Communication Technology to Protect Citizens against Natural Disasters).

Africa is strongly impacted by climate change. However, these kind of tragedies can be better handled if the victims are well aware of the situation.

Thus, African countries have started using SMS text messages to send out alerts to people in order for them to handle the situation better.

For instance, “In Madagascar, where access to up-to-the-minute weather forecasts is limited, local communities currently rely on low-tech approaches to help warn of disasters. The ‘town crier’ system, administered by the National Bureau for Risk and Disaster Management (BNGRC), currently is the main system for alerting rural communities in advance of cyclones. As part of the system, a village leader walks through the community ringing a bell and shouting warnings and instructions. A more high-tech approach is being tested by the Government of Madagascar. Utilizing an SMS warning system for those with mobile phones (estimated at more than 300 phones per 1000 inhabitants in the country), BNGRC sends out messages to local leaders and telecom providers to warn of impending cyclones.”(Using Information and Communication Technology to Protect Citizens against Natural Disasters).

They have distributed 1600 SIM cards to people in rural areas, who don’t have good access to information. Furthermore, thirteen hundred of them already have a menu designed to ease the sending of information to BNGRC, and adapted to the educational level in the rural areas. Moreover, this system not only sends out alerts via SMS, but also collects information about the impacts. This enables them to monitor the impacts in less than 48 hours, and help to identify the most affected areas where the population needs immediate support. (Using Information and Communication Technology to Protect Citizens against Natural Disasters) This SMS message is extremely valuable for Africans because it gives them a head start to avoid disaster.

Another example is the communities along the banks of the Katchisa-Linthipe River in Malawi, which experience high frequently flooding. They work with the Italian NGO COOPI ('Cooperazione Internazionale') and with funding from the European Commission Humanitarian Aid Office's Disaster Preparedness Program (DIPECHO) to monitor the water level. The measurements are sent to communities downstream via mobile phone. If water levels start to rise, people have time to prepare for possible flooding.

Furthermore, the use of text messaging also speeds up the time of aid delivery. "According to the Office for the Coordination of Humanitarian Affairs (OCHA), a pilot programme of Action Aid and infoasaid in Kenya last year showed that sending advance text messages to aid recipients about pending deliveries cut down distribution time from three hours to 30 minutes." (IRIN) Similarly, IFRC says they were able to reach more people in a shorter amount of time in Nigeria when distributing mosquito nets just by sending out text messages before the delivery.

Africa is known as the continent with the most refugees and the most refugee camps. It is extremely hard for individuals to find their family members in a long list of refugees and it is also hard for government to keep in track all these refugees. Therefore, there are mobile services that help people find others much more easily in refugee camps. For instance, an NGO, Refugees United, has teamed up with mobile phone companies to create a database for refugees to register their personal details. (Ogunlesi) The information available on the database allows them to search for people they've lost contact with. This service has saved a tremendous amount of time for people in search of their loved ones and made refugee management more convenient for the government as well.

Politics

Mobile phones have both positive and negative effects on Africa's politics. On the positive side, mobile phones promote activism. However, on the negative side mobile phones enhance the coordination of violent groups, since they can use this technology to coordinate with each other faster. The most basic features of a phone is the ability to communicate and connect people, which is essential to promote a politically empowered citizenry. This feature promotes activism in Africa and is able to transform ordinary citizens disenchanted by their governments into resistance fighters. For instance, in Egypt in 2011, protesters gathered together in Tahrir Square using social media and mobile phones to protest the Mubarak regime. The large crowd of protester wouldn't have been united without the power of mobile phones and social networks. "Eventually, on January 28, the Mubarak regime had to put pressure on Egypt's mobile phone networks to pull the plugs, in a bid to slow down the tempo of opposition activity"(Ogunlesi). Despite the these actions, the crowd momentum had already been built and did not dissipate. This example demonstrates the significant role that mobile phones play in political activism. (Ogunlesi)

Kenyan general elections have always been known as bloody elections. During January and February 2008, hundreds of thousands of people were displaced from their homes, and over one thousand people died due to post election violence. Crime exploded in densely populated areas, such as Luoland. The streets had constant rioting. Farm were looted and roads were blocked. People were unable to go to work. Members of the largest ethnic groups attacked anyone who they felt didn't belong. Minorities or people from foreign countries were often the targets. Over one thousand people died in the post election

violence. However, with phone technology, citizens were able text the violent incidents to a server (Ushaidi platform), which meant the texts were viewable by the rest of the world. If phone technology hadn't been introduced in Africa, these bloody riots wouldn't be public and perpetrators wouldn't have been arrested or tried. (Ogunlesi) Thus phones can help promote the kind of accountability to law and order necessary for a well functioning political system to develop.

Despite all the positive political impacts that phones bring, there are some negative effects that phone have on Africa politics. There have been reports that the presence of phones has caused the increase of violent conflict (Myslewski). Due to the convenience of mobile phones, violent perpetrators can use this tool to communicate with other perpetrators at a faster pace. The overlap between cell phone coverage and conflict is especially clear in Algeria, the Democratic Republic of Congo, Kenya, Nigeria, Uganda, and Zimbabwe (Ruvinsky). This is not suggest that the presence of mobile phones creates violent conflict. The sources of conflict already existed and they are motivated for committing violent crime. Phone becomes the catalyst for this rebel groups. But phones help rebel groups become more organized than ever.

According to Hollenbach and Jan Pierskalla, "a postdoctoral candidate at the German Institute of Global and Area Studies, who co-authored a recent study on this subject. In 2008, for instance, organized violent conflict was more likely to unfold in areas where coverage had existed in 2007 than in areas where it hadn't." (German Institute of Global and Area Studies)

However, the theory of phone increase the rate of violent conflict isn't consistent around the world. When corporations set up cell towers in Iraq which is located in the middle east, the violence in a district or in the vicinity of a tower essentially goes down. "A 2012 report on Iraq found that cell phone service

coverage correlated with less successful violent attacks, not more.”(Fortin) In that case, the cell phone technology enabled the Iraq’s troops and western troops to practice better surveillance. Theoretically, if the government is monitoring the rebel groups correctly. Phones will give them the opportunity to apprehend violent groups long before they do something bad. In other words, the extent of the violence encouraged by mobile phones depends on which actors are most effectively taking advantage of the technology. If violent groups in Africa are using their phones to organize attacks, security forces and government officials can counter them by making better use of mobile technology to prevent such incidents.

I am not suggesting that mobile phones are harming Africa. In fact, the overall effects of mobile phones are positive. The high rate of violent conflict is just living proof that African governments are failing to utilize this technology in the short term, yet African governments could overcome the situation in the long term by better utilizing the phone technology to achieve better surveillance of these potential rebel groups. And as we saw phones can also promote positive non-violent political involvement and change.

In conclusion, the mobile phone has impacted Africa in all sorts of ways. It has changed the African lifestyle. It has impacted politics, the economy, healthcare and education. The benefits mobile phones have brought to Africa outweigh the negative impacts. This tiny device that sits in your pocket is changing life there dramatically.

The mobile phone has had more impact on Africa than on the developed countries. It has take numerous decades for developed countries to come to the

stage they are at nowadays. Undoubtedly, all sorts of technologies acted like catalysts, in this process; they sped up the part of development. Computers and personal laptops are just examples of this type of technology. However, Africa was hindered from boarding this the train of development due to the history of colonialism; they were left behind by the developed nations in economic term. However, mobile phones are currently serving as “super catalysts” which are allowing Africa to fast forward the development process and jump right in to the modern era. They are doing the work that many other older technologies do in the developed world. In other word, mobile phones are enabling Africa to begin to catch up with the rest of the world economically. In the future, they may minimize the gap of wealth between developed nations and Africa. They may also minimize this gap between the wealthy and poor in Africa nations, leading to greater equality and possibly more democracy. Will this phenomenon apply to other regions similar to Africa in terms of development? To know the specific dynamics of phone use in these region will have to be studied specifically, but Africa’s example suggest it might be possible.

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