



SEPTEMBER 24, 2007

SPECIAL REPORT

Upwardly Mobile In Africa

How basic cell phones are sparking economic hope and growth in emerging—and even non-emerging—nations



[Slide Show >>](#)

Precious little would seem to connect the Kenyan village of Muruguru to the 21st century. The red dirt roads become impassable in the rainy season. Only a few homes have electricity, indoor plumbing, or even a floor other than earth packed by bare feet. The villagers survive on corn, potatoes, and bananas they raise in hand-tilled fields, and earn a little extra cash by cultivating coffee beans that they dry outdoors on burlap sacks.

But a couple of years ago, a red and white tower appeared on a nearby hill. The structure is a cell-phone base station, and its arrival has changed life in Muruguru as much as any development in the past century. "I'm saving time, I'm saving money," says Grace Wachira, who runs a small business knitting cardigan sweaters in the village. Before the tower was built, she had to walk several hours to the nearest town or ride in a communal taxi to buy yarn or meet customers, and she never knew whether the person she wanted to see would be there. Now she uses her Motorola (**MOT**) handset to arrange for delivery of yarn and to communicate with buyers.

These days, just about every tradesman, shopkeeper, and farmer in town has a phone—or at least access to one. "Customers give my number to other customers. The business has grown," says Susan Wairimu, whose tailor shop sits in the row of one-story buildings that constitute the village center. And Willson Maragua's transport business in Muruguru, which consists of him and a used pickup truck, could hardly function without mobile technology. Local farmers, members of the Kikuyu tribe prevalent in the area, summon him to haul their coffee beans to a growers' cooperative in a nearby valley. Now Maragua, an ebullient man wearing a baseball cap that says "Bachelorette Party," lives in a home with a concrete floor and a solar panel on the roof to power a radio and a lightbulb—and recharge his family's two handsets. With a mobile phone, he says over a lunch of corn, potatoes, and stewed goat, "You can manage your business."

HIGHER LIVING STANDARDS

Only a few years ago, places like Muruguru didn't even register in the plans of handset makers and service providers. What would a Kenyan farmer want with a mobile phone? Plenty, as it turns out. To the astonishment of the industry, people living on a few dollars a day have proven avid

phone users, and in many parts of the world cellular airtime has become a de facto currency. The reason is simple: A mobile phone can dramatically improve living standards by saving wasted trips, providing information about crop prices, summoning medical help, and even serving as a conduit to banking services. "The cell phone is the single most transformative technology for development," says Columbia University economist and emerging markets expert Jeffrey Sachs.

Mobile phones are changing developing markets faster than anyone imagined. Today there are some 3 billion mobile subscriptions worldwide, and that will grow to 5 billion by 2015, when two-thirds of the people on earth will have phones, predicts Finnish handset maker Nokia Corp. Nowhere is the effect more dramatic than in Africa, where mobile technology often represents the first modern infrastructure of any kind. The 134 million citizens of Nigeria, Africa's most populous country, had just 500,000 telephone lines in 2001 when the government began encouraging competition in telecommunications. Now Nigeria has more than 30 million cellular subscribers. Muruguru, meanwhile, had just a single pay phone before people started getting handsets a few years ago. "Communications used to be a barrier," says Paul Ndiritu, the former village head man. Since the advent of mobile phones, he says, "the burden has eased."

Yet billions of people around the world have still never used a telephone. Most of these unconnected masses live in rural areas that are much poorer and more remote than Muruguru. Now cell-phone makers and service providers understand that they can make money by bringing cell-phone service within reach of people who live on \$2 a day. Users buy new phones for as little as \$20—and secondhand models for far less—as well as airtime in increments of just 75 cents in Kenya, enough for nearly 10 minutes of off-peak calling.

MOBILE MONEY TRANSFERS

That's a far cry from the European or U.S. monthly subscription model, but it works for such outfits as Millicom International Cellular. The Luxembourg-based company invests almost exclusively in poor countries often rocked by violence, and in the second quarter of this year saw its profits climb 65%, to \$263 million. Millicom doesn't even wait for the gunfire to die down before moving into new markets, which include the Democratic Republic of Congo, Sri Lanka, and Colombia. "When you build the network you find really good customers," says CEO Marc J. Beuls.

Many economists would agree. A growing body of evidence suggests that access to communications boosts incomes and makes local economies far more efficient. Consider a group of poor fishermen in the Indian state of Kerala studied by Robert Jensen, an associate professor at Brown University. They increased their profits by an average of 8% after they began using mobile phones to find out which coastal marketplaces were offering the best prices for sardines. Yet consumer prices for fish dropped 4% because the fishermen no longer had to throw away the catch they couldn't sell when they sailed into a port after all the buyers had left. "That's what economic efficiencies are about—everyone is better off," says Jensen.

With characteristic ingenuity and resourcefulness, villagers are proving that handsets aren't just for talking. Mobile phones, for instance, are becoming a way to extend financial services to the billions of poor people who have never seen the inside of a bank. David Omuchilili, who works as a security guard at a church in the town of Ngong, outside Nairobi, uses his battered, 1990s-era Ericsson (**ERIC**) to send a portion of his modest wages to his wife and five children in a village 180 miles away. Omuchilili pays cash to an agent for M-Pesa, a service offered by carrier Safaricom Ltd. In this case, the agent is a cell-phone dealer on a Ngong street that is crowded with stray goats and donkey carts hauling cans of water. The agent then sends a code number via text message to Omuchilili's wife, who uses the code to redeem cash from an M-Pesa agent close to her home.

Although few Kenyans have any experience with e-commerce, the M-Pesa service—pesa is Swahili for "money"—has been a runaway success since Safaricom launched it in March. Some 6,000 people a day are signing up, and Vodafone Group PLC (**VOD**)—which owns 40% of

Safaricom—is thinking of extending the concept to India. "I used to travel home myself. This saves money," Omuchilli says after sending his wife a few dollars. "She needed money to buy food," he explains.

Economists are still trying to calculate the macroeconomic effect of this communications explosion, but no one doubts that it's big. Leonard Waverman, chairman of the economics faculty at London Business School, figures that a 10% increase in a developing country's mobile-phone penetration adds 0.6 percentage points to the economic growth rate. Indeed, the advent of mobile communications in Africa coincides with a surge in growth. The continent's economy will expand as much as 7% this year, a 25-year high, according to the International Monetary Fund. Many other factors are contributing, including high commodity prices, fewer armed conflicts, and better government in countries such as Kenya and Tanzania. But a fundamental principle of economics is that markets need information to function efficiently, and cell phones are providing information to people who never had it before.

The telecommunications industry itself is enjoying a new level of entrepreneurship and job creation in the developing world. Nahashon M. Macharia, a Nairobi-based businessman, is opening new stores selling cell phones and airtime in step with the expansion of Safaricom's network. "Whenever they put up a new mast, we try to provide coverage," Macharia says above the blare of reggae music during opening celebrations for a new outlet in Othaya, a town about 50 miles from Nairobi.

There is even a whiff of startup frenzy as companies spring up to serve the mobile industry. Lagos (Nigeria)-based M-Tech Communications, founded in 2001, develops content—everything from ringtones to crop price information—for mobile-service providers in Kenya, Uganda, Ivory Coast, and elsewhere. "There is significant value in those markets, purely because of the numbers" of people, says co-founder and CEO Chika Nwobi, a graduate of East Tennessee State University. Everyone, it seems, is getting into the act. In Kenya, where Safaricom lets anyone be an airtime dealer, it's common to see vegetable stands selling bananas, tomatoes, cabbage—and scratch cards with codes that grant access to additional calling minutes.

Surprisingly, the per-minute cost of mobile service is often more expensive than in developed markets. Prepaid customers of Vodacom in the Democratic Republic of Congo, a joint venture of Vodafone and African investors, pay 26 cents per minute to make daytime calls within the network, compared with peak rates of roughly 10 cents a minute for U.S. cellular subscribers and 7 cents in Germany. That's because users in poor rural areas often must bear the higher cost of building out networks in areas without electricity or good highways. Safaricom, for instance, wrecks a vehicle a month on Kenyan roads. And theft of generators and fuel means some companies post armed guards at their cell towers.

To keep calling costs to a bare minimum, villagers keep conversations extremely short and make heavy use of text messaging. Flashing—calling and hanging up after the first ring—is also popular. The flash can signify, "I've arrived," "call me," or any number of other prearranged meanings. Phone sharing is also common. Some users just buy a SIM card (which is plugged into the phone to grant access to the network) for less than a dollar and borrow a phone from someone else. Many users rarely make outgoing calls, maintaining just enough prepaid credit to keep their accounts active and receive calls. Meshack Onsinyo Getuba, a TV and radio repairman in the Nairobi suburb of Rongai, alternates between SIM cards from two rival carriers, choosing the one that's cheapest at any given time. Mobile technology, he says, "has improved the lifestyle I am living," because he can call for delivery of spare parts rather than having to fetch them from a dealer himself.

As mobile networks proliferate, they're pushing the development of other infrastructure. Some operators, frustrated with slow-moving power monopolies, build their own electrical lines to base stations. And mobile operators are the driving force behind new networks of fiber-optic cables. South Africa-based MTN, for instance, has installed its own fiber in Nigeria. That will likely lead to

better broadband connections, which could enable English-speaking countries such as Nigeria and Kenya to become major outsourcing centers.

LOCAL OPERATORS

The spread of rural telephone service to the world's poor got an early boost in the villages of Bangladesh. In 1997, microlender Grameen Bank started giving advice and credit to local entrepreneurs, encouraging them to operate communal phone services using mobile handsets—so-called village phones. Since then the concept has spread around the world, and has become a profitable business for operators such as MTN. In Uganda, the carrier rolled them out in partnership with the Washington (D.C.)-based Grameen Foundation but last year took full control of the operation, which now includes 13,000 small-time entrepreneurs. "Village phones made us realize that rural areas were a market," says Francis Ssebuggwawo, a sales supervisor for MTN in Uganda.

Ssebuggwawo makes that observation while steering a Ford (E) pickup along a potholed highway that provides a neck-wrenching lesson in the shortcomings of African infrastructure. He is bound for a settlement called Wabusana, where he plans to check in with village phone operators. Wabusana is only about 50 miles north of the capital, Kampala, but the trip takes nearly three hours each way on badly paved or dirt roads marked by plots of pineapple and six-foot-high conical anthills (which provide a local specialty, sautéed ants). In a clearing, a crowd waits to receive free mosquito nets, the most affordable way to prevent malaria, rampant in this part of Africa.

Finally, Ssebuggwawo brakes at a collection of grim concrete and brick buildings situated at the crossing of two dirt roads. The outpost supports four village phone operators, whose stories show how the spread of telecommunications is providing a livelihood for thousands of Africans. Hasifa Nakitio, who looks to be in her early 30s, feeds 11 children—five of her own, plus six she takes care of for various reasons—with income from the village phone and by peddling cups full of *matoke*, a mashed-potato-like dish made from plantains. Nakitio says she is saving to buy a plot of land and her own house.

Ezeresi Serukeera, a mother of four who runs her village phone in Wabusana from a crude wooden booth, enlarged her house after she obtained a loan of about \$385 to buy the phone gear. Serukeera, who paid back the loan in six months, even serves as a kind of local banker, a conduit for relatives in Kampala to send money home to their families. These people transfer airtime to Serukeera electronically, and she passes on the equivalent in cash minus a small commission, then resells the airtime minutes to other callers.

The operators gather with Ssebuggwawo in the dimly lit interior of one of the buildings, which quickly fills with curious children. The operators bombard him with complaints and suggestions. Why isn't MTN doing more to promote village phones? Why can't they sell talk time in increments of less than a minute? Why doesn't MTN's text message-based information service have more news relevant to farmers, providing, say, the price of pineapple rather than reports on the Iraq war? As more villagers get handsets, the village phone operators point out, they will need other sources of revenue, such as providing information. "We have to think of ways we can add value," Ssebuggwawo agrees, taking notes.

The mobile-phone industry is increasingly listening to people like these village operators, who are at the frontier of telecommunications expansion. Nokia's (**NOK**) latest phone for emerging markets, which retails for about \$37 in Kenya, contains features such as a hookup for an external antenna, to better reach distant base stations, and software making it easier to track the length and cost of calls. "If we look at the next billion subscribers, the vast majority will come from emerging markets," says Kai Öistämö, Nokia's general manager for mobile phones. In India, Nokia Siemens Networks, an equipment joint venture with Germany's Siemens (**SI**), is taking the village phone concept a step further. The company is testing its so-called Village Connection, which allows a local entrepreneur to set up a wireless phone network for a few thousand dollars.

Villagers can talk within the local system at a reduced rate, connecting to the more costly national network only for long-distance calls.

HAVE-NOTS

Of course, the spread of technology to places that have had none is bound to bring unforeseen consequences. Mobile phones can also be used to organize a guerrilla army. (The region around Wabusana was already the focal point of an armed conflict in the 1980s after the fall of Ugandan strongman Idi Amin.) And a new class of resentful have-nots could emerge among the millions of extremely poor people who still can't afford cell phones. Abraham Waigwa, a 28-year-old bricklayer who lives in Muruguru, complains he's having trouble competing with other masons whose phones allow them to be reached by potential employers. "I don't get jobs as often," he says. "My life is dragging."

But that seems to be the minority view. "Mobile technology has brought many fruits, and no bad things," insists Isaac Mahenia, a schoolteacher and part-time farmer in Muruguru. Abraham Maragua, truck driver Willson Maragua's 77-year-old father, agrees that life is finally getting better in the village, and that mobile phones are part of the change. "We feel it," says Maragua, who lives in a house with a dirt floor and old newspapers covering the interior walls. As a onetime political prisoner during Kenya's civil strife in the 1950s, he knows what he's talking about. Says Maragua: "We didn't suffer for nothing."

By Jack Ewing