

## BRIEFING

# THE MOBILE PHONE ‘REVOLUTION’ IN AFRICA: RHETORIC OR REALITY?

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ONLY SUPERLATIVES SEEM APPROPRIATE TO DESCRIBE the mobile phone ‘revolution’ – its impact and its potential – in Africa. Mobile phones are almost always the cheapest and quickest way to communicate, particularly when fixed-line phones and broadband internet are underdeveloped and dependent upon expensive infrastructure. The continent is home to 350 million mobile phone subscribers,<sup>1</sup> and their numbers are growing faster than anywhere else in the world. The ubiquity of mobiles is matched only by the ingenuity of their users. From shantytowns to remote villages, mobile phones are being used to transfer money, monitor elections, and deliver public health messages. A large informal economy has also emerged to support the mobile sector, with people selling airtime, charging and fixing mobiles, and renting them out. Africa is truly a crucible for mobile phone innovation and entrepreneurship. Unsurprisingly, the rapid adoption of mobile phone technology by Africans and its dramatic benefits have frequently been described in unrestrained terms as ‘staggering’, a ‘remarkable phenomenon’, and a ‘revolution’.<sup>2</sup> This transformation is all the more exceptional because it was largely unanticipated by the business or research communities.

Notwithstanding the socio-economic advantages associated with mobile telephony, the industry also faces notable challenges and unintended consequences. Penetration rates (mobile subscriptions per 100 people) vary

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1. David Smith, ‘Africa calling: mobile phone usage sees record rise after huge investment’, *The Guardian*, 22 October 2009, <<http://www.guardian.co.uk/technology/2009/oct/22/africa-mobile-phones-usage-rise>> (14 July 2010).

2. Ken Banks, ‘Mobile telephony and the entrepreneur: an African perspective’, *Microfinance Insights* 8 (2008), <<http://www.oecd.org/dataoecd/27/51/41789311.pdf>> (14 July 2010); Vodafone, ‘Africa: the impact of mobile phones’ (Vodafone Policy Paper Series, 2, March 2005), p. 3; Thomas Kalil, ‘Harnessing the mobile revolution’, *Innovations* 4, 1 (Winter 2009), Special Edition for the GSMA Mobile World Congress.

from under 10 percent in Ethiopia to nearly 100 percent in Gabon,<sup>3</sup> with an average of over 33 percent for the whole continent.<sup>4</sup> The accessibility and use of mobile phones can also entrench and exacerbate unequal power relations between men and women, and between employers and employees. This briefing, therefore, strives to bring balance to the mobile debate, identify information gaps, and also to suggest that understanding the limitations of mobile telephony is a prerequisite when formulating policy to ensure this dynamic technology is harnessed to its best effect.

*The birth and rise of mobile phones in Africa*

The story begins in 1987 when the first mobile call was made in Zaïre, now the Democratic Republic of Congo (DRC).<sup>5</sup> Market liberalization in a few key countries in the late 1990s and early 2000s contributed to the rapid growth in mobile phone subscribers. The increase since 2003 has ‘defied all predictions’, according to Sami Al Basheer Al Morshid, Director of the Telecommunication Development Bureau at the UN’s International Telecommunication Union (ITU).<sup>6</sup> Business leaders and investors did not anticipate that a continent invariably labelled as poor and corrupt would be able to provide the infrastructure and customer base required for considerable market growth. Wedded to mobile phone business models popular in developed countries (based on contracts, sending data, and high-end phones), few realized the potential for growth in Africa along different lines (based on pre-pay phone cards, voice, and low-end phones). In particular, the demand from rural and low-income areas exceeded all expectations.<sup>7</sup> The Sudanese-born businessman Mo Ibrahim – the founder of Celtel (now Zain), one of Africa’s largest mobile operators – was one of the first to invest in mobile telecommunications, but he never predicted its exponential rise.<sup>8</sup>

The *Information Economy Report 2009* has declared that the ‘mobile revolution continues’ and growth is expected to remain ‘robust’, with the African operator MTN anticipating an average mobile penetration of 80 percent by 2012 in 15 African countries.<sup>9</sup> Moreover, these figures under-

3. UNCTAD, *Information Economy Report 2009: Trends and outlook in turbulent times* (UN, Geneva, 2009), p. 4.

4. *Ibid.*

5. Vodafone, ‘Africa: the impact of mobile phones’, p. 3.

6. International Telecommunication Union, *Information Society Statistical Profiles 2009: Africa* (ITU, 2009), p. iii, <[http://www.itu.int/dms\\_pub/itu-d/opb/ind/D-IND-RPM.AF-2009-PDF-E.pdf](http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-RPM.AF-2009-PDF-E.pdf)> (14 July 2010).

7. Nigel Scott, Simon Batchelor, Jonathan Ridley, and Britt Jorgensen, ‘The impact of mobile phones in Africa’ (Background paper prepared for the Commission for Africa, 2004), p. ii.

8. Tayo Akinyemi, ‘Inside the entrepreneur’s studio: a conversation with Mo Ibrahim’, *NextBillion*, 22 June 2009, <<http://www.nextbillion.net/blog/inside-the-entrepreneurs-studio-a-conversation-with-mo-ibrahim>> (25 July 2010).

9. UNCTAD, *Information Economy Report*, p. 4.

estimate the true number of Africans using mobile phone services as handsets and mobile phone subscriptions are frequently shared.<sup>10</sup> Mobile telephony has been rapidly adopted by millions of Africans. Mobile phones are relatively affordable, portable, multi-functional, and easier to use than other technological tools. Their versatility and cost ensure they meet the requirements of a successful technology, which has been defined as matching the 'context, affordability and environment in which it exists'.<sup>11</sup>

The mobile phone industry's failure to predict the spectacular growth of the market in Africa was also echoed by shortcomings in the research community, and the reluctance of some within NGOs to adopt this new technology.<sup>12</sup> In late 2003 Vodafone became increasingly interested in the economic impacts of mobile telecommunications, yet a literature review unearthed 'little systematic evidence' about possible impacts, either positive or negative.<sup>13</sup> The company responded by supporting a programme of research, and in 2005 published a paper highlighting the economic benefits of mobile phones in Africa.<sup>14</sup> The mobile landscape has continued to change dramatically since then with the growth of initiatives using mobiles to support development, including the mHealth Alliance, MobileActive.org, and various aspects of work within the Millennium Villages.<sup>15</sup> These projects are producing their own outputs, credible and prominent research is burgeoning in the mobile-related field, and academic conferences addressing these concerns are now commonplace, including events in 2010 in Edinburgh, Boston, and Kampala.<sup>16</sup>

### *Transforming lives and generating new socio-economic opportunities*

Economist Jeffrey Sachs has championed mobile telephony as 'the single most transformative technology for development'.<sup>17</sup> A seminal study also concluded that mobile telephony has a 'positive and significant impact

10. Vodafone, 'Africa: the impact of mobile phones', p. 3.

11. UNCTAD, *Information Economy Report*, p. 19.

12. Diane Coyle and Patrick Meier, *New Technologies in Emergencies and Conflicts: The role of information and social networks* (UN Foundation-Vodafone Foundation Partnership, Washington, DC and London, 2009).

13. Vodafone, 'Africa: the impact of mobile phones', p. 1.

14. *Ibid.*

15. <<http://www.unfoundation.org/global-issues/technology/mhealth-alliance.html>>; <<http://www.mobileactive.org/>>; <<http://www.millenniumvillages.org/>> (13 July 2010).

16. 'ICT: Africa's Revolutionary Tools for the 21st Century?', Edinburgh, 4–5 May 2010, <[http://www.cas.ed.ac.uk/events/annual\\_conference/2010](http://www.cas.ed.ac.uk/events/annual_conference/2010)> (14 July 2010); 'International Conference on Crisis Mapping', Boston, MA, 1–3 October 2010, <<http://hhi.harvard.edu/events/iccm-2010>> (14 July 2010); 'M4D', Kampala, 10–11 November 2010, <[http://m4d.humanit.org/index.php?option=com\\_frontpage&Itemid=1](http://m4d.humanit.org/index.php?option=com_frontpage&Itemid=1)> (14 July 2010).

17. 'Upwardly mobile in Africa', *Bloomberg Business Week*, 24 September 2007, <[http://www.businessweek.com/magazine/content/07\\_39/b4051054.htm](http://www.businessweek.com/magazine/content/07_39/b4051054.htm)> (14 July 2010).

on economic growth' and the benefits in developing countries may be twice as large as in richer economies.<sup>18</sup> The results showed that a developing country with an average of 10 more mobile phones per 100 population has 0.59 percent higher GDP growth than an otherwise identical country.<sup>19</sup> Mobile telephony is seen as a way of leapfrogging the conventional development process as it bypasses the more extensive and expensive infrastructure needed to establish fixed-line phones. Figures from the ITU show that 90 percent of all telephone subscribers in Africa are mobile subscribers.<sup>20</sup>

The benefits of mobile phones have been broadly grouped into three categories: incremental (improving the speed and efficiency of what people already do), transformational (offering something new), and related to production (selling mobiles and related services).<sup>21</sup> Small business users make incremental gains as mobiles enable customer calls to be answered immediately, including away from the office, and such prompt replies could make the difference between receiving or losing an order.<sup>22</sup> Such instant communication may provide an opportunity to address 'informational challenges', such as 'absence, uncertainty, asymmetry', which dictate the efficiency of markets.<sup>23</sup> In the case of the cloth-weaving sector in Nigeria and the informal construction sector in Dar es Salaam, mobile telephones have reduced costs and saved time, largely by avoiding the need to travel for business transactions.<sup>24</sup>

Transformational successes have demonstrated the dynamism of the sector, particularly adapting to local needs in poor countries. Ban Ki-moon, UN Secretary-General, has highlighted how certain least developed countries are at the forefront of the industry and are 'pioneering new forms of mobile usage', such as facilitating banking transactions and trade.<sup>25</sup>

18. Leonard Waverman, Meloria Meschi, and Melvyn Fuss, 'The impact of telecoms on economic growth in developing countries', in Vodafone, 'Africa: the impact of mobile phones', p. 2.

19. *Ibid.*

20. ITU, African Telecommunication/ICT Indicators: At a Crossroads, <http://www.itu.int/ITU-D/ict/publications/africa/2008/index.html> (29 July 2010).

21. 'Mobile phones and development: the future in new hands?' (Id21 Insights No. 69, Institute of Development Studies, 2007), p. 1.

22. Richard Duncombe and Richard Heeks, *Information and Communication Technologies in Developing Countries: A handbook for entrepreneurs in developing countries* (Institute for Development Policy and Management, Manchester, 2001), p. 19.

23. Abi Jagun, Richard Heeks, and Jason Whalley, 'Mobile telephony and developing country micro-enterprise: a Nigerian case study' (Development Informatics Working Paper Series No. 29, Institute for Development Policy and Management, Manchester, 2007), p.1.

24. *Ibid.*; Tom Molony, 'Trading places in Tanzania: mobility and marginalization at a time of travel-saving technologies' in Mirjam de Bruijn, Francis Nyamnjoh, and Inge Brinkman (eds), *Mobile Phones: The new talking drums of everyday Africa* (Langaa and African Studies Centre, Leiden, 2009), p. 180.

25. UNCTAD, *Information Economy Report*, p. iii.

M-Pesa – a mobile payment service in Kenya – is the shining example of such innovation. It has enabled people without bank accounts to have access to easy-to-use, widely accessible and cheap money transfers. The initiative enables customers to send money quickly and securely to another mobile phone user. M-Pesa, a public–private partnership operated by Safaricom (part of the Vodafone Group), was created with initial financial support from the UK's Department for International Development (DfID).<sup>26</sup> Since its launch in March 2007, M-Pesa has exceeded expectations and now has more than five million customers (more subscribers than bank account holders in Kenya).<sup>27</sup> Its overwhelming popularity is testament to its utility.

The transformational benefits of mobile telephony also operate outside economics, particularly within the health sector. Mobile phones are now used as tools to collect health data, support diagnosis and treatment, and disseminate health education in poor settings.<sup>28</sup> Examples include daily text message medication reminders sent to tuberculosis patients, and Uganda's Text to Change project, which raises HIV/AIDS awareness via a text message-based quiz.<sup>29</sup> Access to mobile phones has also been credited with preventing women dying in childbirth in Amensie, in south-central Ghana, as villagers can now call the ambulance when it is needed.<sup>30</sup> Another example from Ghana demonstrates the diversity of mobile health (mHealth) initiatives. The start-up company mPedigree has developed a service in the country which enables consumers to check whether pharmaceuticals are counterfeit. A code displayed on the medication is sent via text message to mPedigree and the consumer receives a text almost instantly to say if the product is genuine.<sup>31</sup> The company was named one of 34 Technology Pioneers at the World Economic Forum in 2009.<sup>32</sup>

The accessibility and functionality of mobile phones have also enabled them to be used in innovative ways across a spectrum of other fields, including veterinary medicine, politics, and the environment. For instance, students at the Royal Veterinary College, part of the University of London,

26. Nick Hughes and Susie Lonie, 'M-Pesa: mobile money for the "unbanked". Turning cellphones into 24-hour tellers in Kenya', *Innovations*, 2, 1–2, (2007), p. 66.

27. *Ibid.*, pp. 80–1.

28. mHealth Alliance, <<http://www.unfoundation.org/global-issues/technology/mhealth-alliance.html>> (13 July 2010).

29. Vital Wave Consulting, *mHealth for Development: The opportunity of mobile technology for healthcare in the developing world* (UN Foundation-Vodafone Foundation, Washington, DC and Berkshire, UK, 2009).

30. IRIN, 'Ghana: cell phones cut maternal deaths', 1 December 2009, <<http://www.irinnews.org/Report.aspx?ReportId=87261>> (14 July 2010).

31. Jennifer Schenker, 'mPedigree's RX for counterfeit drugs', *Business Week*, 3 December 2008, <[http://www.businessweek.com/globalbiz/content/dec2008/gb2008123\\_027994.htm?chan=globalbiz\\_special+report+-+tech+pioneers+of+2009\\_special+report+-+tech+pioneers+of+2009](http://www.businessweek.com/globalbiz/content/dec2008/gb2008123_027994.htm?chan=globalbiz_special+report+-+tech+pioneers+of+2009_special+report+-+tech+pioneers+of+2009)> (14 July 2010).

32. World Economic Forum, 'Technology Pioneers 2009', <<http://www.weforum.org/en/Communities/Technology%20Pioneers/SelectedTechPioneers/index.htm>> (14 July 2010).

used mobile phones for data collection regarding the health of cattle in Zanzibar in 2009. Using a multiple choice form (developed on the Google Android platform) on their mobile phones, the students entered details about the animals they examined, specifically to track the spread of East Coast Fever. This approach has many advantages: the data can easily be captured, stored, shared between vets, and uploaded to a central database. The system avoids the inefficiencies, delay, and inaccuracies often associated with transferring handwritten records to a central system.<sup>33</sup> Mobile technology is also being used for political applications as a means to improve transparency and accountability. During the Nigerian elections in 2007 volunteers sent their observations about the poll via text message to a central database, and these reports were then relayed to other monitoring groups, including the EU.<sup>34</sup> Such two-way communication was powered by FrontlineSMS – free and versatile software that enables users to communicate via text message with large groups of people wherever there is a mobile signal (importantly, internet access is not required).<sup>35</sup> Novel developments are also occurring in relation to environmental projects. Mobiles are to be used to promote reforestation as part of a climate change mitigation project in Ethiopia. The plan is for tree-planting activities to be monitored by local forestry associations using mobile phones and for mobile payments to be transferred to rural farmers for planting trees.<sup>36</sup>

Moreover, the impact of mobile telephony is magnified when it converges with other forms of ICT. For instance, the popular Kenyan TV series *Makutano Junction* delivers development education, covering topics from abortion to HIV/AIDS, primarily through its broadcasts, but supplements this with an interactive text message service.<sup>37</sup> Text messages are also an integral part of Ushahidi.com – one of the most dynamic web-based innovations of recent years. Ushahidi, which means testimony in Swahili, was created to document the violent aftermath of the Kenyan election in December 2007. Witnesses were asked to submit their reports of violent acts via text message, email or web form and the aggregated results were then displayed on a Google map.<sup>38</sup> Ushahidi has proved so popular and effective that this crowd-sourcing platform has been replicated throughout

33. Niall Winters, Andrew Hagner, and Nick Short, 'Androids in Africa' (Paper presented at LIDC's Mobile Phones and Development Workshop, London, 9 October 2009).

34. BBC, 'Texts monitor Nigerian elections', 20 April 2007, <<http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/6570919.stm>> (14 July 2010).

35. FrontlineSMS, <<http://www.frontlinesms.com/>> (14 July 2010).

36. Matti Pohjonen, 'Chasing the long tail of climate change: mobile phones and carbon sequestration in rural Ethiopia', (Paper presented at LIDC's Mobile Phones and Development Workshop, London, 9 October 2009).

37. Guy Collender, 'Workings of a Kenyan TV soap: how drama promotes development', 8 April 2009, <[http://www.lidc.org.uk/news\\_detail.php?news\\_id=54](http://www.lidc.org.uk/news_detail.php?news_id=54)> (14 July 2010).

38. Ushahidi.com, <<http://legacy.ushahidi.com/index.asp>> (14 July 2010).



the world, and used to document fighting in the DRC and xenophobic attacks in South Africa. Ory Okolloh, Ushahidi's co-founder, recognizes the risk of false reporting when handling information generated by anonymous sources, but expresses confidence that the volume of responses negates any false reports and enables a 'truth' to emerge.<sup>39</sup>

The growth of the mobile sector has also generated production-related benefits within the formal and informal sectors. The large telecommunications companies – part of the formal sector – provide jobs, and generate substantial tax revenues for the countries where they operate. (The amount of tax levied per mobile phone user has been criticized as 'disproportionately high in many developing countries', ranging from an annual average of US \$24 to US\$179 in 16 of the most heavily taxed countries).<sup>40</sup> Meanwhile, entrepreneurs, often in the informal sector, are adopting imaginative ways to benefit from the popularity of mobile phones. They are selling airtime, ringtones and phone covers, and providing 'mobile' mobile services by travelling to their customers by bike with phones and spare batteries.<sup>41</sup>

#### *The limits of mobile telephony and missed opportunities*

Despite these manifold successes, many people in Africa are still marginalized or excluded from accessing the benefits of mobile telephony because of barriers that include cost and the lack of adequate regulation and policy. Mobile telephony may contribute to widening the gap between the poor and the poorest, leading to what Manuel Castells has defined as the 'fourth world' – a non-consuming and non-producing marginalized group which is 'structurally irrelevant in the current structure of the global economy'.<sup>42</sup> For example, within the informal construction sector in Dar es Salaam the use of mobile phones is broadly 'stratified along employment lines' as employers and middlemen own mobiles while many employees, apprentices, and family labourers are unable to afford a handset, let alone the running costs.<sup>43</sup> However, more data on usage are needed to inform this debate about the digital divide. Current figures refer mostly to the number

39. Ory Okolloh, 'Ushahidi, or "testimony": Web 2.0 tools for crowdsourcing crisis information' in *Change at Hand: Web 2.0 for development*, Participatory Learning and Action Series, No. 59 (International Institute for Environment and Development, London, 2009), p. 67.

40. GSMA, 'Tax and the digital divide: how new approaches to mobile taxation can connect the unconnected', 2005, <<http://www.ictregulationtoolkit.org/en/Publication.3376.html>>, (14 July 2010), p. 4.

41. 'Mobile phones and development', p. 1; Banks, 'Mobile telephony and the entrepreneur', p. 25.

42. Quoted in Jonathan Donner, 'Shrinking fourth world? Mobiles, development and inclusion' in James Katz (ed.), *Handbook of Mobile Communication Studies* (MIT Press, Cambridge, MA, 2008), p. 30.

43. Tom Molony, 'Trading places in Tanzania', pp.175–86.

of subscribers (those who have a sim card) and owners (those who own a mobile handset), rather than specific patterns of use and users.

Cost and usability problems restrict many from benefiting from the full functionality of mobiles. Often people are limited to ‘beeping’ to curtail costs. A widespread practice in Africa, this involves dialling a mobile phone number and hanging up before the owner can answer. Often these beeps mean the mobile owner should call back, but they can also relay a planned message, such as ‘pick me up now’, or be a relational meaning, for example, ‘I’m thinking of you’.<sup>44</sup> The difficulties of scaling up mobile phone technology have also been highlighted by development practitioners and grassroots NGOs. The pilot veterinary project conducted in Zanzibar, for example, revealed two major obstacles: the mobile phones are very expensive for local vets, and the on-screen forms need to be completed in a specific order, which can be problematic when conducting physical checks on animals.<sup>45</sup> Low levels of literacy in certain countries and the lack of software content in local languages are also obstacles to using text messages and navigating menus.<sup>46</sup>

Government restrictions and state control have also been shown to hinder the growth of the mobile phone sector. For instance, Burundi, Djibouti, Eritrea, Ethiopia, and Somalia – all characterized by a state telecommunications monopoly or the lack of strategic investors – are the only five countries with mobile penetration rates of less than 10 percent.<sup>47</sup> Thomas Kalil has argued that the lack of competition in these countries is the main cause of the low mobile penetration rate, as it discourages private sector investments and consequently impacts on the cost of mobile services.<sup>48</sup> Such state monopolies are often motivated by political factors. For example, during the 2005 election the Ethiopian government shut down the text messaging system, which was being used by the opposition for mass communication; at times the ruling party also distributed misinformation via text messages.<sup>49</sup> But the role of the state remains a double-edged sword, and has the potential to improve access to the mobile sector as well.

Among other policies, governments can increase competition by opening up to more operators and reducing barriers to foreign investments.<sup>50</sup> Invest-

44. Donner, ‘Shrinking fourth world’, p. 1.

45. Winters, Hagner, and Short, ‘Androids in Africa’.

46. Matt Jones and Gary Marsden, *Mobile Interaction Design* (John Wiley and Sons, West Sussex, 2006).

47. UNCTAD, *Information Economy Report*, p. 4.

48. Thomas Kalil, ‘Harnessing the mobile revolution’, p. 21.

49. Fahamu, ‘Mobile phones, human rights and social justice in Africa’ (Report, Fahamu, Oxford, 2007); Lahra Smith, ‘Political violence and democratic uncertainty in Ethiopia’ (Special Report 192, United States Institute of Peace, August 2007).

50. Kalil, ‘Harnessing the mobile revolution’. On the important role of governments in formulating policies that make it difficult to create ‘monopolies and price-fixing’ in the mobile sector, see also Calestous Juma, ‘Development Matters Podcast Interview’, February 2010, <[http://openair.fm/components/com\\_podcast/media/LIDC\\_-\\_Calestous\\_Juma\\_Final\\_2.mp3](http://openair.fm/components/com_podcast/media/LIDC_-_Calestous_Juma_Final_2.mp3)> (14 July 2010).



ment (private and public) is needed to strengthen the mobile infrastructure, and institutional reform is also a precondition for a successful development strategy. 'Regulation on behalf of the public interest' should be a priority if 'technological overdevelopment' is to avoid being hampered by 'institutional underdevelopment'.<sup>51</sup> According to Nick Hughes and Susie Lonie, 'The better the regulator understands the capabilities and limitations of services like M-Pesa, the better and more appropriate the regulation will be'.<sup>52</sup> This is echoed in a recent Research ICT Africa report: 'It is up to policy makers to create an environment that supports innovative applications and to adjust regulation to evolving institutions'.<sup>53</sup> Without governments and private-public partnerships, successes in one part of the continent cannot automatically be replicated elsewhere. Mobile banking, which has been extremely successful in Kenya, is having much less impact in other countries, demonstrating that building the service is not a guarantee for success.<sup>54</sup>

It is also necessary to remember that advanced technologies can be used in positive or negative ways, and mobile phones are no exception. Being instant, affordable, accessible, and personal, mobile phones were used to devastating effect as a 'weapon of war' to circulate destabilizing rumours and hate messages during the violent aftermath of the Kenyan election in 2007.<sup>55</sup> Richard Dowden has echoed these findings:

mobiles were swamped with hate messages urging people to rid the country of Kikuyus or warning Kikuyus that they were fighting a conspiracy to rob them of what was theirs. Gangs of killers on both sides used their mobiles to coordinate their attacks.<sup>56</sup>

### Conclusion

Millions of Africans have benefited from being able to communicate instantly and relatively cheaply with family, friends, businesses, and services because of mobile telephony. Mobile phones have clearly had a revolutionary impact on many lives, but not all. There is also now a vibrant and growing critical mass of technologists, entrepreneurs, and activists experimenting with new ideas in the mobile sector. Fora like Web2forDev and Africa Gathering<sup>57</sup> are generating their own momentum and leading to a

51. Manuel Castells, 'Afterword' in James E. Katz (ed.), *Handbook of Mobile Communication Studies* (MIT Press, Cambridge, MA, and London, 2008) pp. 450–1.

52. Hughes and Lonie, 'M-Pesa: mobile money for the "unbanked"', p. 93.

53. Alex Comninos *et al.*, 'M-Banking the unbanked' (Policy Paper 4, Research ICT Africa, 2008), p. 11.

54. 'Mobile banking in Tanzania: can Kenya's success be replicated next door?', CGAP, 21 July 2009, <<http://www.cgap.org/p/site/c/template.rc/1.26.10908/>> (25 July 2010).

55. Michelle Osborn, 'Fuelling the flames: rumour and politics in Kibera', *Journal of Eastern African Studies* 2, 2 (2008), p. 317.

56. Richard Dowden, *Africa: Altered states, ordinary miracles* (Portobello Books, London, 2008), p. 323.

57. <<http://www.web2fordev.net>>; <[www.africagathering.org](http://www.africagathering.org)> (25 July 2010).

productive exchange of ideas regarding innovation and entrepreneurship. However, the poorest continue to have the least access to mobile phones and restrictive regulations in certain countries limit the involvement of many. We have argued that, in addition to more research, a close collaboration between different interests (including state, mobile companies, banks, and donors) is necessary to improve the socio-economic potential of mobile telephony. New models, such as the public-private partnership which kickstarted M-Pesa, should be further developed. When imagination, technology, and efficient regulation combine they can be harnessed effectively to ensure mobile telephony makes even more significant advances in Africa.