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At the turn of the millennium, the ICT4D (information and communication technologies for development) discourse had envisaged that access to the Internet and computers would induce development in the Global South. Ideas about the empowering capacities of both computers and mobile telephony echo media and communication scholars' debate on the digital divide. The digital divide concept emerged in the 1990s to refer to the unequal access and usage of digital technologies. Castells' (2001: 269) argument that not having access to the internet is tantamount to marginalization in the global, networked system summarized the digital divide idea well.

India's National e-Governance Plan, NeGP, which in 2006 endeavored to provide all government services at computer kiosks, is an example of the kind of influence ICT4D discourses have had on the national development strategies. However, as Sreekumar and Riviera-Sanchez (2008) conclude, most of the computer-based ICT experiments failed dismally in poverty reduction. Cecchini and Raina's (2002) research on a pilot project in rural India exemplifies some of the challenges of inducing development through giving people an access to computers: in the Maharastra village they studied in India it was mostly the rural elite who used the public computer services.

In comparison to computers, mobile phones are more affordable, require less infrastructure, do not require the user to have much technological knowledge, or to be able to read and

write. Mobile phones have emerged as the first extensive electronic communication system during past two decades in most parts of the developing world. 92 per cent of people in developing countries had mobile phone subscriptions in 2015, whereas only 34% of households in developing countries had internet access at that time (International Telecommunication Union, 2015).The rapid spread of mobile telephony revived many of the hopes for development which the ICT4D had raised; consequently, Mobiles for Development (M4D) discourse emerged to address the use of mobile technologies in global development strategies.

In this article, I begin by providing an overview of the key issues of the scholarly debate on mobile telephony and development within social sciences. My main focus will be on how the use of mobile phones for developmental purposes in India relates with state initiatives and policies. Drawing upon my research on the appropriation of mobile telephony in rural India, I then highlight how ethnographic research can contribute to this debate by exploring how the appropriation of mobile telephony in rural West Bengal influenced economy, healthcare as well as governance and politics. I argue that digital ethnography, which explores the appropriation of phones as part of everyday life over a time-span, can play a role in helping us understand both the possibilities and limitations of digital innovations, as well as the need for multiple solutions to problems due to complex social processes.

The Promise of M-development

In India, the rapid growth in phone density coincided with broader economic reforms. Similar telecommunications sector's deregulation has accompanied mobile telephony growth in most

parts of the Global South. The expansion of mobile telephony is thus often celebrated as a showcase example of how neoliberal globalization can promote development and reduce poverty. Indeed, transnational companies have emerged as builders' of infrastructures and, hence, as initiators of development policies—a role which was earlier considered to fall under the purview of states (Horst 2013). As Horst (ibid.) argues, this change, in turn, necessitates a new research agenda to explore the changing roles of transnational companies and states as well as mobile phone users' agency. In his review of mobile telephony and development literature, Donner (2008) distinguishes three strands of the discussion: scholarly works on the factors which determine the diffusion of mobile phones in developing countries, studies on mobile phones' impact on development and on how users actively choose to use their phones—of these, I discuss the two latter ones.

Most social scientists are critical of technological determinism, which views technical innovations, or technology in general, as the sole or prime causes of changes in society. Nevertheless, economists have been interested in exploring the role of mobile telephony in economic development. Using data from 92 countries between 1980 and 2003, Waverman, Meschi, and Fuss (2005) found that an increase of ten mobile subscriptions per 100 people increased a country's GDP growth by 0,6 percent. Donner's (2009) study on mobile phone use by micro-entrepreneurs in Rwanda revealed some of the everyday practices through which phones improve the efficiency of economic activities: phones helped entrepreneurs to extend their market, stay in touch with their customers, collect stock, and deliver products efficiently. He found that most of the productivity gains arose from the phones affording people, who are beyond a convenient traveling distance—even if the distance is just a matter of a kilometer or two—the possibility to exchange information rapidly. Jensen's (2007) longitudinal study of sardine prices at various landing ports in northern Kerala, India over

five years has become one of the most cited examples of the economic benefits of mobile phones. Jensen (ibid.) found that the arrival of mobiles brought significant and immediate reductions in the price variability and in the amount of waste in Kerala's fishing system. His findings have not only been generalized to other contexts, but they have also resulted in the development of a myriad of mobile-technology-based applications that convey price information to small-scale entrepreneurs in the Global South. However, Srinivasan and Burrel (2016), who returned to the site of Jensen's work to explore the generalizability of his findings, argue that the fish trade in northern Kerala is a special case: The coastal geography and prevalent credit relationships there enable the fishermen to optimize their profits by using their mobile phones to sell to different markets. Conditions are different, for instance, on Kerala's southern coast where—unlike in the North—the steep ocean floor and rough surf prevent the use of large boats. Srinivasan and Burrel (2016) also maintain that Kerala fish markets cannot be regarded as archetypical free markets, because fishermen collectives and government regulation have crucially influenced them. Moreover, there is a great difference in how fishermen profit from their mobile phone use even in northern Kerala. The use of mobile phones to access price information are most important for affluent fish market actors, who can afford to invest in their trade and, consequently, catch higher volumes of fish.

Interest in the economic impacts initially dominated the M-development debate. However, most ethnographic studies on mobile telephony in the Global South indicate that people largely tend to use their phones for other purposes than mere narrow economic ones (Donner 2009, Horst and Miller 2006, Sey 2011, Archambault 2011). Crentsil (2013) has showed how mobile technology can be harnessed to increase the well-being of the most vulnerable part of the population in Ghana—HIV positive women who can currently simply phone in, determine their next counseling date and discuss their treatment with hospital counselors.

Nevertheless, only a third of the patients Crentsil (ibid.) interviewed possessed a phone. The calling costs are another major challenge for patients and local health workers. In Indonesia, the government gave mobile phones to midwives in order to improve health services in the rural province of Aceh which was recovering from the devastating impact of the 2004 tsunami. Chib and Hsueh-Hua Chen (2011) describe that the possibility to get advice over the phone gave midwives the courage to handle difficult pregnancy cases. Midwives also benefited from the community's increased trust. However, Chib (2013) argues that despite ample evidence of successful MHealth projects utilizing mobile telephony to improve communication, co-ordination, and access to health care (Fjeldsoe, Marshall, & Miller, 2009; Cole-Lewis & Kershaw, 2010; Krishna, Boren, & Balas, 2009), there is still inadequate proof of mobile phone adaption for mass healthcare.

Ethnographic studies of mobile telephony have vigorously challenged the technological determinism and optimism inherent in the M-development discourse. Horst and Miller (2006) observed that phones rarely helped people in Jamaica start new businesses; instead, they use phones to solicit economic help, which burdens the welfare of those from whom assistance is frequently sought. Archambault (2011) found that, in Mozambique, young people's opportunities to use phones for development purposes were limited due to a lack of jobs and business opportunities. She hence broached the idea that the link between ICTs and development might be based on wishful thinking. By studying phone users' positionality in various contexts in urban China, Wallis (2013) shed light on why marginalized workers' use of mobile phones will not necessarily lead to greater income, a better job, or more autonomy. Phone use may also turn out to be detrimental for phone users' welfare as in a Dar es Salam slum, where minors conceal their sexual behavior with the help of mobile phones which contributes to the intergenerational transmission of female poverty through early pregnancy

and marriage (Stark 2013). The abovementioned ethnographic studies demonstrate that impact studies have tended not to take into account the many factors which, beside mobile telephony, influence phone users' well-being. The SCOT (Social construction of technology) paradigm, which has revealed technologies as socially constructed, helps us understand that also mobile telephony's consequences depend on how users choose to use phones and on the terms on which they are offered mobile services. As Wajcman (2002) argues, ICTs do not offer simple technological fixes for social problems, but are part of social changes through the ways technologies are socially produced and used.

Recent research has sought to develop a more nuanced understanding of the role of mobile technology for development by paying attention to mobile phones' range of benefits for users. Oreglia (2014) discovered unlikely ICT users from rural China where older women, helped by their children and peers, maintain relationships and access entertainment online. Among market women in Ghana, the phone's utility laid in enlivening trade networks instead of impersonally acquiring or exchanging information (Oreglia 2014). As Burrel and Oreglia argue, based on their research among farmers in China and fishermen in Uganda, in addition to price such variables as long-term relationships with trade partners and attitudes towards risk influence economic decision making (Burrel and Oreglia 2015). Ling et al. (2015) found how, among the Trishaw (rickshaw) pullers in Myanmar, mobile phones have strengthened ties with important clients, meaning a more stable income, but also an enhanced power for these customers.

Ethnography of phone use in an Indian village

I have observed the appropriation of mobile telephony in Janta, a village in rural West Bengal, India, ever since people started to use phones there. I subsequently take stock of how mobile telephony influenced development in this village based on my ethnographic research from 1999 to 2013. Drawing on Nussbaum (2000) and Sen (1999) whose definitions of development take capabilities into consideration, i.e. what people are effectively able to do, instead of merely measuring wealth and poverty levels, I broadly understand development as improved well-being and capabilities.

Janta is a multi-caste village with 2,441 inhabitants (Census of India 2011) in the Bankura district of West Bengal in the eastern part of India. By 2013 all households had phones and most households possessed a smartphone. As phones had become ubiquitous, differences in usage emerged. Low-income families share an understanding that phones need to be used sparingly, whereas the upper classes can spend generously on phone calls. Wealthier people can make and receive tens of calls a day, whereas low-income families only receive and make a few calls weekly. The villagers' monthly phone expenses varied between INR 30 and INR 1000.

Most phone owners use the internet indirectly on their phones. They buy music, videos, and pictures, which are downloaded on their phone's memory chip in shops selling chips, and content downloaded from the internet. Although this practice differs crucially from the autonomous use of smartphones to browse the internet, it offers easy and affordable access to internet contents. The few people in the village who have used their personal phones to browse the internet belong to a small college educated minority (around 1 per cent of the village population)—accessing the internet's textual content requires an even higher level of

literacy than operating the phone for calling. The few who had tried the internet had found many uses for it: Facebook, downloading music and movies, finding out about prices, products, jobs, and exam results, as well as sending e-mail and accessing study sources, such as literature and dictionaries.

Mobile telephony's shifting economic influence

People mostly used their phones for calling their relatives and friends, and I have demonstrated how these calls contribute to changes in gender and kinship relations (Tenhunen 2014). However, occasional calls for specific instrumental purposes were also of great importance to villagers. When I asked mobile phone owners how they benefit from their phones, the prevalent answer was that a mobile phone enables one to do more in less time: One can now manage various errands within a fraction of the time and costs they previously required. My initial research on the mobile phone use of the early adapters in Janta supported earlier research findings on the economic benefits of phones for small scale businesses. It did not take the local entrepreneurs in Janta long to realize that mobile phones could help them extend their clientele. Mobile phones allow micro entrepreneurs to keep in touch with their customers, even when they are on the road. Phones are also used to check product availability, order stock, and compare wholesale prices in different markets. Phones helped people in diverse fields increase their income and their businesses' efficiency (Tenhunen 2008). Nevertheless, the picture of mobile phones' economic benefits became more complicated after I had a chance to observe phone use in diverse economic fields over time.

Most of the small scale entrepreneurs concentrate on selling their services to the villagers. While the villagers do call stores to inquire about a product's availability, phones have not increased store keepers' business margins considerably. Instead, store keepers maintain that they use phones for the convenience and not to increase their income. Depending on their ability to obtain credit from wholesale sellers, store owners can order stock for their village store from the nearby town. Consequently, they now spend less time commuting. If they need to travel to make the purchase themselves, they can first call and check the product's availability before they travel to do so. However, the convenience of doing business that phones offer has helped more people start stores, which has led to increased competition.

Local entrepreneurs who have benefitted economically from phones are: insurance and investment agents, carpenters, mechanics, a chicken farmer, and artisans who build wooden structures and other constructions for celebrations. They not only use their phones to communicate with wholesale markets and customers in the village, but also to extend their clientele to people outside the village. Carpenters and insurance agents report modest economic gains, while the chicken farmer prospered remarkably. The latter was among the first persons in the village to obtain a mobile phone and, shortly after, he also bought a three-wheeler, which helped him extend his clientele as he can receive orders even when he is out making deliveries. These further investments caused a five-fold increase in his monthly sales. He soon invested in the village's first refrigerator to store chickens. In addition to the new logistical efficiency that phones enable, this business has benefitted from the growing demand for chicken meat which in turn was enabled by the growth in agriculture and economic prosperity since the 1980s.

Competition has not increased fiercely in the chicken business, because chicken farming requires large investments to raise the chickens and transport them to customers. Most other businesses that successfully use mobile phones to increase their profitability have had to deal with growing competition. For instance, an agent who trades agricultural products explained that his mobile phone allows him to carry out more business transactions than before. However, the ease of doing such business has increased competition, which, in turn, has lowered his profit margin. Mobile phones have been more instrumental in increasing the number of economic activities in Janta and the surrounding region than in helping individual entrepreneurs earn better incomes.

Whereas deals concerning the selling of agricultural produce were previously closed by signing a written contract well in advance of the products' delivery, sellers can now continue haggling with various buyers until it is time to deliver the products. The prices can be settled by phone at the very last moment, which has decreased the middlemen's profit and benefited the farmers. There is, however, a great variation in how farmers have benefitted from phones. Middle-size and large farmers regularly ascertain the vegetable prices in the nearby towns of Bishnupur, Bankura, Asansol, and Durgapur. Nevertheless, it is unprofitable to transport large crops, such as paddy and potatoes, far. Most people therefore prefer to sell them in the markets close by. Even middle and large farmers often rely on a dealer who has provided them with credit to invest in farming, as many such dealers also act as moneylenders. Small scale farmers do not benefit from comparing prices between different markets by phone, because they do not have much to sell at a market. A farmer may travel daily to sell just a few vegetables at the Vishnupur open market, using the day's income to buy groceries there.

The biggest economic change in the village since the turn of the century was not due to the use of mobile phones, but to the agricultural policies which have led to small farmers' decreasing profits. The price of fertilizers and gasoline has increased, while income from the sale of agricultural products has dwindled. Since farming small plots of land has become increasingly unprofitable, young men from small farms use their phones to find paid employment outside the village.

Mobiles for healthcare: Opportunities and limitations

Villagers perceive the ability to call for help as one of mobile phones' most crucial benefits. I met people who had been motivated to purchase their first phone due to a family member's illness. Phones allow seriously ill patients in the village to be transported to a doctor, or a hospital, as it is possible to hire a car by phone. However, phones have not made it possible to summon trained medical help to the village in times of emergencies. Public health centers do not have sufficient staff to attend patients outside the center, and trained medical doctors in towns do not leave their clinics to attend patients in villages. The self-taught doctor who lives in the adjacent village is the only person family members can call if a villager is too sick to travel.

People do not trust either the public or private health-care systems in the region, nor those in West Bengal state. Faced with serious illnesses, the villagers prefer to spend large sums of money to travel to southern India to obtain proper treatment at the few hospitals with a good reputation for fair pricing and reliable care. Traveling to South India to obtain care in a

foreign language environment is an arduous task for the villagers. People who have acquired an understanding of the medical organizations in the few popular South Indian hospitals, offer their services as medical agents for payment, traveling with patients and helping them obtain treatment. Recently, many of my friends and acquaintances have travelled alone from Janta to South India after other people had phoned them to relate their experiences and told them how to cope with and obtain treatment at these hospitals. Phones also help raise money for medical treatment from relatives and help patients stay in touch with the health-care personal outside the village, or with previous patients who have travelled to other states to obtain medical treatment.

Two public health workers in the village have phones, but do not use them to stay in frequent touch with the villagers, because the government's small remuneration does not cover their phone costs. They had two weeks' medical training and their duties are to collect information about the health situation in the village, to advise people about child nutrition, and to encourage women to give birth in hospitals. The worker responsible for getting pregnant women to give birth in hospitals phones pregnant mothers occasionally, because her remuneration is based on the number of women she can persuade to do so. She has, however, not benefitted economically, as she now spends the major part of her remuneration on phone costs. A worker in charge of child welfare in the village does not use her phone to communicate with the villagers due to these costs. Instead, she uses her phone to communicate with the health administration. Health workers regularly report on the people they have advised, including providing the administration with their phone numbers, so that their superiors can check that the reported cases actually exist.

Mobile phones and political agency

While the state in West Bengal is not availing mobile technology to deliver services, mobile phones, nevertheless, proved influential for the direction of state politics in West Bengal (Tenhunen 2011). Mobile telephony was a crucial factor in the rise of the opposition in West Bengal, where the Communist Party (CPI (M)) had been in power from 1977 until 2011, when the Trinamul party gained power. In 2010 opposition activists related to me how mobile phones help them secretly mobilize against the ruling party, and party activists are among the heaviest phone users in rural West Bengal. Although phones helped both the opposition and the ruling party act more efficiently, opposition activists used phones for spontaneous activities, such as organizing wildcat strikes and reporting the ruling party's misdeeds, more than the ruling party. Opposition activists emphasized that phones help them react faster to events. News about local political disputes can be communicated upward in the party hierarchy, and party leaders can in turn coordinate political action and request that news about such action be spread horizontally through the party hierarchy's lower levels and among other potential supporters.

CPI(M) rule was not solely based on violence, but coercive means have been crucial for its electoral success repeatedly (Gupta 2010). Where the CPI(M) sought to overpower the opposition through violent means, Trinamul organized protection through phones, sending its cadres to protect its supporters even if an attack was merely anticipated. Nevertheless, political activists use phones more to organize party meetings and offer political patronage than to organize spontaneous demonstrations and support. The parties' power is largely derived from their role as arbitrators of disputes: any person who feels that he or she has suffered an injustice can call a village meeting, led by local political leaders, during which a

solution will be negotiated between the disputing parties. Political activists and leaders receive calls from people in different types of trouble, and phones have made it possible to react faster and to accomplish more in a shorter time-span than previously. As a result, patronage is now increasingly sought from other sources in addition to local leaders.

Conclusion

This article has exemplified how the developmental impacts of mobile telephony relate to state policies in rural India. The use of mobile telephony in local politics improved the possibilities to safeguard the transparency of public fund usage. At the same, there were power shifts which transferred power from village leaders to translocal political organizations. However, changes in local politics induced by mobile telephony had little influence over policies of the Central Government nor did they translate into immediate improvements in health care or agricultural policies which mostly fall under the purview of state governments in India. The market rationality and cost efficiency enabled by phones did not guarantee economic growth for all stake holders. In addition to the ability to communicate, the level of the competition, the market size and its growth rate as well as governmental economic and agricultural policies influence the profitability of small scale businesses crucially. Nor could the efficiency provided by phones compensate for the shortcomings of the public health care systems. Identification of mobile telephony as belonging to the realm of the market hampers its use for developmental purposes. Service provider companies have not been able to provide affordable health care solutions or useful information for the low-income people as part of their business practices in a sustainable ways while state has not introduced initiatives for harnessing the potential of mobile technology for development in India.

My ethnographic research shows that despite their many benefits for users, mobile phones alone do not solve developmental problems: there is a need for multiple solutions due to complexity of social processes. As Donner (2015) notes, ICT4D discourses have emerged as heterogeneous: They now stretch from shallow technologically deterministic approaches to views which capture complexities, as well as potentialities (Donner 2015). An overarching interest in a few success cases and successful pilot projects at the expense of sustainable development has dominated M4D discourses. Long-term holistic ethnographic research can improve our understanding of how to better encourage digital inclusion through policy and design. Communication between different stakeholders—states, service providers, handset manufacturers and NGOs— is challenging but M4D conversation provides possibilities for such a dialogue.

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