

RESEARCH ARTICLE

Inter-ethnic Cooperation Revisited: Why mobile phones can help prevent discrete events of violence, using the Kenyan case study

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This paper will critically explore why mobile phones have drawn so much interest from the conflict management community in Kenya, and develop a general set of factors to explain why mobile phones can have a positive effect on conflict prevention efforts generally. Focusing on theories of information asymmetry and security dilemmas, collective action problems, and the role of third party actors in conflict prevention, it aims to continue the discussion around Pierskalla and Hollenbach's recent research on mobile phones and conflict risk. Given the successful, high profile uses of mobile phone-based violence prevention in Kenya I will identify a set of political and social factors that contribute to the success of crowdsourcing programs that use mobile phones, and explain what makes them transferable across cases for conflict prevention in other countries. The primary findings are that a population must prefer non-violence since technology is a magnifier of human intent, that the events of violence start and stop relative to specific events, the population knows to use their phones to share information about potential violence, and that there are third party actors involved in collecting and validating the crowdsourced data.

Introduction

The problem of ethnic political violence, and more broadly inter-group political violence, has been extensively studied by political scientists, sociologists and social psychologists, but has always proven difficult to deal with in a practical and operational way. There are a grim litany of examples to draw from when we try to understand why ethnic groups act out violently, including at low levels of violence (e.g. ethnic riots) all the way up to genocidal levels (e.g. Rwanda, the Balkans). Broadly speaking, we can make an argu-

ment that information asymmetries concerning access to representation and resources between groups leads to inter-group security dilemmas, and these security dilemmas lead to the outbreak of violence. Pierskalla and Hollenbach's recent analysis of how mobile phones facilitate the organization of violence identifies mobile phones as a tool to overcome collective action problems in organizing violence (2013). This analysis can be expanded on by positing that mobile phones can be used to facilitate and manage the collective action problems associated with conflict prevention as well. Technology is an amplifier of human intent (Toyama 2011), and thus increases the capacity of institutions focusing on peacebuilding and conflict

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prevention to manage and mitigate dangerous information asymmetries.

Since 2007 there has been increased interest in using mobile phones, social media, and open source mapping for conflict prevention. While the concept of 'crisis mapping'¹ predates more modern 'crowdsourcing'² approaches, the concept of using mobile phones as the core information and data transfer device for aggregating highly localized information, which can be analyzed using formal methods, has only received significant traction in the conflict management, disaster response and development communities in the last 5–6 years. I will focus on the impact of mobile telephony on information sharing for preventing discrete events of violence, touching on processes such as mapping and social media as appropriate.

We start with a literature review of inter-ethnic violence, focusing on theories of information asymmetry and security dilemmas. To better understand how needs and perceptions within groups can be manipulated, the paper will also look at theories of economic and geographic drivers of conflict as secondary factors within the information environment. Through this literature review I aim to better understand how ethnic violence coalesces, and be able to make inferences about more broadly defined inter-group political violence.

I will then explore the tools and processes that are prevalent in the technology-for-peacebuilding-and-conflict-prevention realm. This section of the paper is critical since much of the available technology is only well understood by a relatively small group of the mainstream political science and peacebuilding community. I will begin with an overview of mobile telephony, mapping tools and social media, defining what each tranche contributes and providing examples of each in practice. This will be followed by a discussion focusing specifically on mobile telephony, since mobile phones are becoming increasingly ubiquitous in the developing world and high-risk countries, and many of

the mapping and social media tools can operate off the mobile platform.

To bring the conversation of inter-group conflict theory and mobile technology together I will look at the case of Kenya. Kenya's violence in 2007–8 was the outcome of inter-ethnic political balkanization, and in many ways is well described by theories of information asymmetry and inter-group security dilemmas. Out of this came the first large-scale, open source conflict mapping platform called Ushahidi, which draws its information from a mobile telephonic interface which uses a Google-style map to mark events of violence. Kenya, which has embraced information communications technology in recent years, has become a pinnacle example of mobile telephony and crowdsourcing for conflict prevention and development. But even with a number of years of observed success, there is relatively little theorization of why this technology has had such a striking impact in Kenya. This question is valuable, since the same technology at work in Kenya is also widely available in Iran, Egypt, and Indonesia, but the results of access to this technology is different across these various cases.

To explore this question I assume that technology in Kenya leads to information symmetry between voting blocs/ethnic groups through mobile phone communication, and that this increasing symmetry decreases the security dilemmas between the groups. Kenya's ethnic groups are not recognized as inherently violent toward one another, so much of the balkanization and security dilemmas between the groups are driven by top-down communication processes, with limited lateral communication between groups at the local level. Thus, we assume that by increasing communication laterally at the various levels of governance (local, district, national, etc.) with mobile phones, the narrative of risk and violence is less likely to have the same level of impact as it competes with alternative information at local levels.

To analyze this assumption further I will develop a set of four factors that indicate whether a polity is apt to use mobile phones for conflict prevention purposes, focusing on how these factors can inform the work of the institutional peacebuilding work of non-governmental organizations (NGOs) and international organizations. The goal is to begin to formalize how we understand the positive impact of mobile telephony-based information sharing as a component of institutional conflict prevention and mitigation programs in cases where political and inter-group information flows are similar to Kenya's.

The paper will close with an analysis of how to add complexity to the four base factors, possible methods for deriving empirical data for testing the assumptions, and what this research could mean to the use of technology in peacebuilding.

Information Asymmetries and Security Dilemmas Between Groups

The notion of conflict as the outcome of an information failure has a long history. The Realist school of International Relations assumes that states must be prepared to project force in an anarchic global environment to maintain a position of power relative to other states (Waltz 1979; Mearsheimer 2001). Generally speaking, states exist to pursue their own interests, and since states have, at best, incomplete information about one another's intentions, the optimal choice is to make sure you are prepared to attack first to maintain a position of relative strength. Game theoretic studies have demonstrated that this notion holds up to scrutiny when the sample is inter-state warfare (Bueno de Mesquita 1980). As the Cold War settled in, this model of interstate warfare based on a Clausewitz's concept of projecting state politics and interests through military conflict (1982) squared less with the increasing occurrence of intrastate civil wars and rebellions during the 1960s onward (Hewitt, Wilkenfeld and Gurr 2008; Levy 2007).

To address the fact that conflicts were less likely to be fought between states in pursuit of power, but instead fought within states between governments and insurgencies, we started looking at power and access asymmetries between ethnic and political groups. This was initially dealt with by Gurr in his work on relative deprivation theory and minority rebellion (1970; 1993). Gurr's early work on relative deprivation focused on the systematic exclusion from the political process and access to goods of certain groups by the state (1970). Horowitz later addressed the issues surrounding lower social rank and the desire to overturn systems (1985), leading to Gurr's later analysis of why minorities rebel, focusing on political structures and identity protection within states (1993).

During the 1990s, when interethnic violence took center stage in global conflicts ranging from southern Africa up into the Balkans, analysis of the relationship between ethnicity and conflict began in earnest. To better understand the question of how information and narrative can cause inter-ethnic conflict, we can look to the Triadic Structure of political mobilization (Levinger and Lytle 2001). The triadic structure is a historical framework where a leader draws on notions of a glorious past, a betrayal in that past, the current weakened state of the in-group, and a prescription for regaining previous glory, often through violence. This structure is an example of a top down communication stream, where the perception of risk is developed by a single, or limited number, of elite actors as part of a political process (ibid). In the case study, Levinger and Lytle analyze the way that Slobodan Milosevic used historic narrative to create an aggressive notion of Serbian nationalism (ibid). Kaufman makes a similar argument, explaining how symbolic politics lead to the ethnic violence in Rwanda and Sudan (2006).

The dissolution of Yugoslavia was a strong theme within the work of ethnic conflict theory. Lake and Rothchild (1996) view ethnic violence not as 'ancient ethnic hatred' but

instead view inter-ethnic violence as the outcome of inter-group competition, taking into account perceptions of future risk.

As groups begin to fear for their safety, dangerous and difficult-to-resolve strategic dilemmas arise that contain within them the potential for tremendous violence. As information failures, problems of credible commitment, and the security dilemma take hold, groups become apprehensive, the state weakens, and conflict becomes more likely. Ethnic activists and political entrepreneurs, operating within groups, build upon these fears of insecurity and polarize society. (ibid: 1)

Lake and Rothchild provide an analytic skeleton on which to build complex narratives like Lvinger and Lytle's Triadic Structure. Similar information and risk dynamics are at work when analyzing inter-ethnic cooperation though. Fearon and Laitin highlight inter-group policing of behavior, and systems for inter-group interaction that allow for information to be exchanged between groups, mitigating against risks associated with information failures (1996). This kind of information exchange is where mobile phones can have a significant impact on the increased likelihood of cooperation and conflict prevention; mobile phones increase the ability of groups to share information about risk with each other and third party actors, and by sharing this information the likelihood of an information failure that could lead to violence decreases. Recent analysis of how to support information exchange, particularly in countries where politics, resource access and ethnicity are interwoven, has indicated that hybrid structures of conflict management that include government, international organization and local information sharing using ubiquitous mediums, such as mobile phones, can decrease the risk of violence (Alihodžić 2012; Kumar and De la Haye 2012). Mobile phone systems and SMS text messag-

ing can potentially provide the medium for inter-group information sharing at all levels, from local to elite, and thus help decrease information asymmetries during politically tense periods.

Communication Technology for Development and Conflict Management

Perhaps the most important aspect of mobile communication technology and digital aggregating systems is that they provide a system that can handle fine grained data in a way that makes information sharing across groups easy and manageable at a technical level. This section will cover a basic history of using ICTs for peacebuilding, applicable technologies, and how they integrate through the mobile telephonic system.

Using ICTs for peacebuilding is rooted in the longer history of Information Communication Technology for Development (ICT4D) which first came into the lexicon of development in the early 1990s, at a time when the use of email and computing were expanding in the public sphere. Richard Heeks refers to this time period as ICT4D 1.0. Notably this period is characterized by a focus on the development of computer centers paid for with large aid budgets, demanding large scale infrastructure which ultimately proved unsustainable as a mechanism for development (2009). Heeks would claim that at present we have reached ICT4D 2.0. which is being driven by emerging mobile technology (2009). This is in many ways more sustainable as a development enterprise since the level of investment in infrastructure and maintenance is much lower (Martin-Shields 2011).

Before moving into applications, I will briefly define mobile phone types. Many of us are using smart phones, which are devices that have internet and computing capabilities. These are still unusual in the developing world, but are becoming more common. What we more commonly see in developing countries is what is referred to as a feature

phone. It can send and receive phone calls and text messages, and has a camera, but cannot connect to the internet the way a smart phone can. The most basic dual-band phones can only make calls and receive text messages; they often lack color screens and cameras. These are common phones in the developing world as well, and because of this many of the tools we will look at in this section are optimized to work with these.

In the modern era, which we will call ICT4D 2.0, the mobile phone is the dominant platform for information communications in the developing world. Thus, it makes sense that many of the tools that are being used for conflict prevention and good governance are in some way linked to a mobile phone platform. For example, we can look at the evolution of crisis mapping as a process managed from Washington, D. C. This type of mapping uses pre-identified reporters feeding information to analysts at the U.S. Holocaust Memorial Museum where data is loaded onto Google Earth,³ to the coding and launch of the Ushahidi platform over the course of three days in 2007 which drew on Google's mapping architecture to provide a system for receiving text messages from an unbounded crowd to be loaded onto a live map viewable by the public. The integration of the mobile phone was what made the first *Ushahidi* map of the electoral violence in Kenya so significant; anyone with a mobile phone could report on an event and it could be publicly displayed.

The original Ushahidi map was coded during the election violence as a place to gather data on events from the 'crowd.' What the tool did was receive a text message, and an administrator could approve the message (or not approve it), and if the message was approved as viable it would be put on the digital map for the public to be able to see (Ushahidi 2011). Since then, Ushahidi has been used to respond to victims of Haiti's earthquake (ibid), and to track the violence in Libya during the uprising against the Gaddafi regime (Meier 2011). Along with being one

of the first of its kind, it is also garnered so much attention because it interfaces with SMS text messages and mobile phones. This means that a huge portion of the Kenyan public were able to report on what they were seeing. Mobile phones and mapping technology were recently integrated effectively to prevent violence during Kenya's 2010 constitutional referendum; the project was called Amani 108, and used an integrated system of mobile phones, broadcast radio and an open digital map to provide the public with updates and to receive information so that responses to violence could be managed quickly (UNDP 2011). This program will be discussed in further depth later.

Outside the development sector mobile phones are being used in peacekeeping operations as a tool for monitoring situations where larger scale information systems are not practical (Dorn 2011). The idea is to use mobile telephony as a secondary mechanism for intelligence gathering in peacekeeping operations, where the intelligence is not great to begin with (ibid). The Democratic Republic of Congo's United Nations Organization Mission in the Democratic Republic of Congo (MONUC) provides a case study of mobile phones being used in peacekeeping operations. In the MONUC mission, peacekeepers used mobile phones to communicate and receive information from local actors about militia activity and violence (ibid).

Along with mapping and SMS text messaging, the recent events in the Arab world demonstrated the impact that social media such as Twitter and Facebook can have on the development of political movements and public voice. Organizations such as the UNDP, NDI, and World Bank are realizing the importance of these social media tools to development, conflict management and democratic governance.⁴ Continuing the theme of mobile telephony as the core technology, these social media platforms are most abundantly used in the developing world through mobile phone networks. People can use Facebook and Twitter on the

internet through their smart phones. This is the core of ICT4D 2.0: Provide connectivity in a way that is sustainable, which can be achieved on internet enabled mobile devices instead of hard wired internet data centers.

Where the Technology and Theory Converge with Kenya as an Observation

Having discussed theories of inter-group and inter-cultural conflict and cooperation, and the tools available through mobile telephonic networks for communication and governance, we now have an opportunity to think about the impact of technology on conflict prevention from a theoretical standpoint. This is an area that is still under developed relative to the volume of interest and operational work being done with these kinds of technological tools in conflict-prone settings.

This section will introduce the case of Kenya, and discuss ongoing ICT for peace-building programs there; since 2007 the development and launch of the Ushahidi mapping platform Kenya has been the proving ground for mobile telephone-based election monitoring and conflict prevention systems (as well as other types of development programs, including mobile banking and mobile market reporting for farmers). Using a basic analysis of contemporary Kenyan politics, I will analyze why the mobile phone is such a popular tool for governance and conflict management in Kenya and lay out the factors for why this is.

What we can draw from the literature review of theory is that there are two broadly defined drivers of inter-group and inter-ethnic conflict. The first is based on information asymmetries and the security dilemmas caused therein (Bueno de Mesquita 1980; Fearon and Laitin 1996; Laitin and Rothchild 1996), while the second general track covers inclusion, access to goods and services, and economic variables (Collier and Hoeffler 1998; Collier and Hoeffler 2004; Fearon 2004; Gurr 1970; Gurr 1993; Levinger and Lytle 2001).

Opportunities for integrating these two tracks have been limited, but with the emer-

gence of mobile communications, public digital maps and social media, we now have an information space that can handle quantitative and qualitative information simultaneously. While this has been put to work in the operational realm by organizations such as the UNDP, formalizing our assumptions about the effect of these information systems has not been as rigorously explored theoretically. A brief discussion of Kenyan politics, and the role that ethnic identity and elite messaging play in the political process, can help understand why technology has been relatively successful in the Kenyan conflict management sphere.

Brief Discussion of Kenyan Politics

Kenya experienced a serious event of political violence in 2007 over the results of a national election. Since this was a discrete event of violence, as opposed to a war where violence is ubiquitous, we will assume that a key factor in using mobile phones for conflict prevention is that we are trying to prevent a relatively predictable, discrete episode of violence. In terms of the theoretical framework we are looking at though, does Kenya's inter ethnic violence blend information asymmetry security dilemmas based on assumptions of access to goods and services? Is the aggression between groups inherent across societal strata, as in the case of Rwanda in 1994, or is it something manufactured by the political or elite classes to maintain voting blocs during discrete election periods?

In terms of a basic background, Kenya was ruled by Daniel arap Moi until 2002 when his party was swept from power by a well organized opposition; while this led to hopes for a new democratic country, the institutions for governance were weak and a great deal of power was vested in the executive branch (Ndegwa 2003; Barkan 2004). Kenya also had a long history of political violence generally perpetrated along ethnic lines and managed by elites (Okumbo 2011). What is interesting about the role of ethno-politics, at least starting in the early 1990s during a democratization wave in Africa, is that ethnicity cor-

related with competition but did not cause it. We can look at the early 1992 analysis of the 1991 democratic openings in Kenya, where Holmquist and Ford point out that Kikuyu and Kalenjin tension was based on an economic calculus; wealthy Kikuyus were increasingly unhappy with a Moi regime that had been mishandling the economy since the 1980s (1992). Land reform was also a core part of the democratic equation, with ethnic affiliation and access to land resources driving voters into blocs (ibid).

Ethnic violence can also be seen as a manufactured function of political power projection. Pre-colonial Kenya experienced inter-ethnic violence and the British used these ethnic identity conflicts in a divide and conquer approach to controlling Kenya (Holmquist and Ford 1994). This method of divide and conquer was adopted by Jomo Kenyatta when he solidified the power of the KANU party with Kikuyu backing in 1963, and was deployed by Moi to mitigate the effects of open elections in 1992 and 1997 and protect Kalenjin interests (ibid). This brand of ethno-economic political violence was what almost led to a civil war in 2007. What is interesting is that inter group ethnic relations are generally stable, and many Kenyans just identify as 'Kenyan' as opposed to an ethnic group (Hanson 2008). This reinforces the analysis that much of the violence and competition is driven by political elites, who use youth gangs and ethnic clientism to stay in office, in what amounts to winner-take-all election process (Mueller 2008). In many ways parties are politically indistinguishable in terms of policy, and use shifts in ethnic group positioning to maintain power over different voting blocs (Mueller 2011). This type of political behavior has often led to some level of violence, but the violence in 2007 was at a much higher intensity.

Within this is a clue that can help understand the reason that mobile phone-driven communication technology is having a significant impact on governance and peacebuilding in Kenya: Kenyans do not seem

interested in violence at the local level. The violence is manufactured at the political level peaking at election time due to the ethno-politics and winner-take-all stakes (Holmquist and Ford 1992 1994; Mueller 2008 2011). The 'ancient ethnic hatred' notion finds little support in the case of Kenya (Hanson 2008). We also see that institutions are underdeveloped, and that there are land and resource pressures in the western portion of Kenya. Thus, what we see is a case where inter-group information asymmetries, manufactured or stoked by political elites, who focus on risks associated with exclusion of access to economic and social goods, creates a security dilemma between ethnic groups that solidifies voting blocs for political leaders. This logic is what we will use to identify four factors that could help explain the positive impact that mobile technology is having on the governance and peacebuilding sectors of Kenya.

Logic of Using Mobile Technology for Conflict Prevention

Since Kenya's political dynamics were only used to be illustrative of certain communication and information systems within a polity, I will propose four factors indicating when mobile phones can have a positive effect on institutional efforts for peacebuilding and conflict prevention generally. While not a formal model, they could be used to understand the political environment where we could expect to see mobile phones have a positive effect on conflict prevention and peacebuilding. These factors are:

1. Violence is not the preferred outcome among the general population. Violence is the outcome of a process of manufactured fear and perceived risk among the general population, led by political elites.
2. Events of violence are discrete events that occur during particular periods in the political calendar, in the case of Kenya during elections. Thus, violence starts and stops relative to external

events, as opposed to being a state of sustained warfare.

3. When there are more mobile phones and the population knows that they can be used to report violence, reach authorities, and gather information about the environment, citizens will make use of their phones in this pursuit since they do not prefer violent outcomes. We assume that large-N samples of people want to cooperate, and will find ways to cooperate over time if they are able to communicate and modify their behavior based on emerging knowledge of other actors' behavior (Axelrod 2006).
4. There is buy-in from the government, and there is support/enforcement for conflict prevention measures from external actors such as the UN or African Union, who provide the added confidence that one or both conflict parties will not cheat on a peace agreement or peace process (Walter 2001; Fortna 2003, 2008). There are strong institutions in Kenya working in the peacebuilding space, helping to manage the collective action problems associated with not participating in violence (see Ostrom 1990 for more on the role of institutions in managing collective action problems).

It is difficult to demonstrate these factors statistically, because the actual use of mobile phones varies depending on the individual, and the data on the content of messages is both unstructured and potentially impossible to access. Instead I will highlight two examples where mobile phone information sharing was or is being used to prevent violence by encouraging lateral information sharing between groups, providing training on how to use mobile phones for conflict prevention, and include a third party monitor. Sisi Ni Amani is a grassroots program, while the Uwiano Platform for Peace is a governmental effort.

Sisi Ni Amani

Sisi Ni Amani, which is Kiswahili for 'We are peace,' is a grassroots peacebuilding program that links local NGOs in Kenya to support peace efforts at the local level. While Sisi Ni Amani has programs that are not technology-focused, one of their core projects is a SMS text message subscriber service that provides information about leadership, local news, and provides a neutral source for information during tense periods such as elections (Sisi Ni Amani 2013). This effort is in direct reaction to the violence in 2007/8, which was facilitated in part by mobile phone communication; Sisi Ni Amani is making an effort to take the same medium and use it to project political information, and knowledge about peacebuilding:

'During Kenya's 2007–8 post-election violence, communication technologies were used to trigger and facilitate violence. Mobile phones in particular were used to spread hate speech and organize attacks. With Kenya's 2013 elections fast approaching, we have the opportunity to tap into these same communication channels, particularly mobile phones, to prevent and de-escalate tensions and violence.' (Sisi Ni Amani 2013)

Sisi Ni Amani currently runs mobile phone SMS programs across Kenya, and works with national networks such as the National Steering Committee on Peacebuilding and Conflict (NSC) to increase the reach of their programming to as many communities as possible (Okuthe 2013). Does Sisi Ni Amani fit the the four factors listed above? Their work engages communities where there is a preference for peaceful conflict resolution and stability, and their work has focused on preventing violence during specific events like elections. They work with a growing community, and work to link communities for peacebuilding and cooperation. They are also a third party that can provide support

and capacity building to communities during high risk periods, such as elections. Measuring their causal impact on peace is difficult, although the theoretical arguments for conflict prevention as a function of increased information sharing across the maximum number actors during a discrete event of violence are met.

Uwiano Platform for Peace and Amani Kenya @108

Amani Kenya @108 operates differently from Sisi Ni Amani's mobile phone SMS information sharing since it is rather a data collection and management program. It is part of the Uwiano Platform for Peace comprehensive peace architecture, which encourages information sharing between government, international, and NGO actors in Kenya who are working to prevent violence (Chuma and Ojielo 2012; NSC 2013). The Uwiano Platform for Peace, which was supported by the UNDP, NSC, and included input from grassroots NGOs such as Sisi Ni Amani, was developed to rapidly gather, validate, and share information to prevent violence during the 2010 Kenyan constitutional referendum (Ndeta 2013). Through the inclusion of a large number of actors who did not want violence, with oversight from a third party in the form of the UNDP, they were able to play a key role in helping to prevent violence during a discrete high risk event (Ryan 2012). While the broadcast medium, the mobile phone SMS text messaging system, was not the causal driver in the Uwiano Platform for Peace's success in 2010, it played a critical role in that it rapidly allowed a larger number of actors across political and social strata to participate in the violence prevention process.

Problems with the Four Factors, and Practical Risks

The most significant problem with the four factors listed in the previous section is the difficulty with demonstrating them empirically. What they're meant to do is provide a logical frame for thinking about inter-group

competition and cooperation theories with observations of how mobile telephones can be used to support inter-group cooperation and decreased risk of violence. They do not cover all the complexities associated with conflict prevention in Kenya, or other places, but instead address the question of how information sharing can support larger conflict prevention efforts.

There are problems with transference between cases as well. We selected Kenya because it has examples of mobile technology actively being used to support peaceful political and governance development. As a case, there are still significant political and economic problems in Kenya that have yet to be resolved (Okumbo 2011), which will not be solved using this kind of technology alone. What makes Kenya unique is its highly developed technology and communication infrastructure, exposure to the greater global community (it is a major United Nations hub, U.S. ally in East Africa, and base for hundreds of NGOs), and a comparably well-developed political identity among its population (Hanson 2008). It is questionable whether this kind of information sharing could be replicated in the Democratic Republic of Congo (DRC) due to a lack of infrastructure, and different geographic and demographic factors. The same technology and conflict prevention structures at work in Kenya could have only a negligible impact on elections in countries such as the DRC.

Worse than negligible impact is the risk that mobile technology will make things worse. For example, it is unlikely that a mobile communication-based information regime would have made the genocide in Rwanda less likely, since the Hutu-Tutsi narrative of risk was ubiquitous at all strata of society, and the UNAMIR mission lacked credibility as a prevention force. In this case it is likely that a mobile phone system would have merely turned up the volume on the hate speech, while providing real-time organizing capacity for the militia groups who led the violence. This kind of dynamic, where there

is not a counter-narrative to violence, or where there are no institutions using mobile phones for conflict prevention, is the kind of environment where Pierskalla and Hollenbach's (2013) observations would be very accurate. Along with being used to increase the level of risk-increasing information, there is the risk that people will not fully understand the risks of using mobile phones this way. For institutions it is critical to have staff that are trained and understand risk management when using telecommunications technology in politically unstable regions, as well as the telecommunications laws in the country they are working in (Martin-Shields 2013).

Finally, we should recognize that mobile phones might not have the same effect on preventing different types of violence in Kenya and elsewhere. Practitioners should recognize that there are different levels and modalities of violence that can be observed in the case of Kenya; I selected election violence because the successful applications of mobile technology have tended to focus on this space. Mobile phones and access to communication may have limited or no impact on violence unrelated to elections, such as banditry or domestic violence.

Next Steps and Initial Conclusions

Given the very aggregate nature of the four factors, this paper aims to act as a starting point for developing a theoretical understanding of how mobile phones can be used for conflict prevention. It highlights the challenges with gathering empirical evidence for demonstrating the four factors, and provides a suggested method for further expanding this research using mixed methods, focusing on field-based interviews with end users of mobile technology. Using these interviews, researchers can then revisit the four factors and make adjustments based on the observational data gathered from field work. This kind of fine-grained information can provide disaggregated knowledge of large-N social dynamics that are important to the operation of a mobile reporting system in a conflict prevention modality.

What we are witnessing with the expansion of mobile telephony, social media and real-time mapping technology is the opportunity to democratize the process of information sharing during crises, giving voice to millions of citizens who otherwise would not be heard. A concerted effort to develop deeper theoretical understandings of the implications for using mobile technology for conflict management, governance, and development could enhance conflict prevention and peacebuilding efforts, increasing the positive affects of people working to achieve peace and stability in the places they call home.

Notes

¹ 'Crisis mapping' is defined as using an interactive digital map to track events in a crisis situation (natural disaster, violence, etc.) in real time. One of the leading early examples of crisis mapping was the U.S. Holocaust Memorial Museum's 'Crisis in Darfur' project, which used Google Earth imagery to map reports of violence in Darfur onto a publicly viewable map (<http://www.ushmm.org/maps/projects/darfur/>). Later efforts at crisis mapping included mapping the earthquake in Haiti (<http://haiti.ushahidi.com/>), and recently UN-OCHA's map of the events during the Libyan uprising (<http://libyacrisismap.net/>).

² 'Crowdsourcing' is a method of data collection that draws on voluntary contributions from an unbounded crowd to determine answers to questions. Generally, crowdsourcing is done through mobile phones using text-based polls and surveys (but can really be done in any way that allows a public audience to provide feedback to a question), and was first extensively written on by Wired Magazine writer Jeff Howe. For more, see Howe's 'The Rise of Crowdsourcing,' Wired Magazine, June 2006.

³ See earlier discussion of the Darfur mapping project at the USHMM in note 1.

⁴ Examples of how these organizations are using these tools can be seen in the

UNDP's Uwiano Project, NDI's office for ICT and Governance, and the World Bank's Innovation Group.

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