Post-Ethnic Politics?
Why mobile phones have such a significant effect on conflict prevention, using the Kenyan case study

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The phenomenon of politicized ethnic identity and its accompanying violence is a unique challenge for conflict resolution theoreticians and practitioners. The mix of central narrative control and information asymmetries between ethnic groups and their leaders within the government creates a dynamic where ethnic identities can be manipulated toward violent ends for political gain. In this space have emerged public mapping platforms, SMS text message based public reporting systems, and social media, all of which are changing the way that governance and conflict prevention is undertaken. Kenya's post-colonial political development has been marked by a politics of division, where politicians found success in maintaining conflict between ethnic groups in order to control voting blocs. This practice underpinned the significant violence over the disputed election in 2007-8, nearly pushing the country to civil war. What has made Kenya unique since 2008 is the proliferation of political activism through the increasingly ubiquitous mobile phone system and indigenously developed mapping software like *Ushahidi* and *Uwiano*. These platforms provide people with a voice to report violence in a public setting, challenging centrally controlled narratives and shrinking information asymmetries between potentially competing groups. This paper will critically explore why mobile telephonic systems for e-governance and conflict management have been so effective in Kenya, using a formal model to explore the logic and caveats surrounding the impact of mobile phones in peacebuilding and development.

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Introduction

The problem of ethnically defined political violence, and more broadly inter-group political violence, has been well theorized by political scientists, sociologists and social psychologists, but has always proven difficult to deal with in a practical, operational way. We have a grim litany of examples to draw from when we try to understand why ethnic groups act out violently, either at low levels (e.g. the deadly ethnic riot) all the way up to genocidal levels (e.g. Rwanda, the Balkans). Broadly speaking, we can make an argument 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. We will use this argument as our general framework for discussing the impact that emerging communication technology is having on conflict prevention and conflict analysis theory.

Since 2007 there has been an explosion of interest and operationalization of mobile phones, social media, and open source mapping within the peacebuilding and development communities 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 and building policy around small-n

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[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.

qualitative data using large-N analysis methods has really only received significant traction in the conflict management, disaster response and development communities in the last 5-6 years. In this paper we will focus on the impact of mobile telephony on information sharing in conflict prevention settings, touching on processes such as mapping and social media as appropriate.

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

We 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 technology available is still only well known within a small sample of the mainstream humanitarian community. We will start 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 we 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 into a Google map to mark events of violence. Kenya, which has embraced information communications technology in recent years, has become the 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 highly 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 vastly different in each case.

We will explore this question assuming that technological success in Kenya is the outcome of information symmetry between voting blocs/ethnic groups through access to mobile communication, and that this increasing symmetry continues to decrease 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 systems. Thus, we assume that by increasing communication laterally at the various levels of governance (local, district, national, etc.) with mobile phones, the top down narrative of violence and risk is less likely to have the same level of impact as it competes with alternative information at lower levels.

To analyze this assumption further we will develop a basic probability model, which will posit that event likelihood is inversely related to the number of information sharers in a system. This analysis will address the caveats and assumptions that must be understood for the model to work, as well as the risks and problems that come with over-reliance on the model in a practical setting. The goal of the model is to formalize how we understand the positive impact of mobile telephony-based information sharing as a component of a conflict prevention and mitigation program in cases where political information flows are similar to Kenya's.

The paper will close with an analysis of how to potentially improve the model, possible methods for deriving empirical data for testing the assumptions of an improved version of the model, and what this research could mean to the field of technology for peacebuilding as well as the traditional field of conflict analysis and resolution.

Information Asymmetries and Security Dilemmas Between Groups

The notion of information asymmetries and security dilemmas leading to conflict is rooted in the field of rational choice theory. We see the classical example of the security dilemma interwoven with political morality in Thycidides' "Melian Dialogue"; the Athenians, en route to Sparta stop in Melios and determine that they must destroy it in order to project the necessary image of power that will cause others to think twice before attacking them (Thycidides 1972). They cite a moral imperative in the destruction of Melios, since choosing not to destroy it could cause them to appear weak, inviting attack and putting their citizens at risk (ibid).

The realist school of International Relations carries this analysis forward by assuming that states must be prepared to project force for much the same reason, although in a more complex environment. 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 attack first when you are at your most powerful. Game theoretic empirical 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 though, this model of interstate warfare based on a Clauswitzian notion of projecting state politics and interests through military conflict (1984) no longer squared with the increasing occurrence of intrastate civil wars and rebellions during the 1960s onward (Gurr, Hewitt and Wilkenfeld 2009, Levy 2007).

To address the fact that conflict was 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). The initial 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 addresses the issues surrounding lower social rank and the desire to overturn systems (1985), leading to Gurr's more refined later to looking more closely at why minorities rebel, focusing on political structures and identity protection within states (1993). In the case of this paper, while Gurr is instructive in his analysis of exogenous risk factors, the model is more focused on top down structural and physical violence enacted by the state against rebellion by a minority group, but does not provide a method for analyzing information flow between actors.

During the 1990s, when interethnic violence took center stage in global conflicts ranging from southern Africa up into the Balkans, analysis of ethnicity and conflict began in earnest. Huntington's work on the notion of a "clash of civilizations" (1993) garnered attention, but again did not deal with information flow and risk analysis between groups at the intra-state level. To better understand the question of what shapes inter-ethnic behavior, we can start with 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. The triadic structure is an analysis of a top down communication stream, where the perception of risk is developed by a single, or limited number, of actors as part of a political process (2001). In the case study, Levinger and Lytle analyze the way that Slobodan Milosevic used historic narrative

to create an aggressive notion of Serbian nationalism. Kaufman makes a similar argument, claiming that 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, and is an area that this analysis will draw heavily upon. Lake and Rothchild (1996) view ethnic violence beyond the simplistic notion of "ancient ethnic hatred" and view inter-ethnic 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." (pg.1)

Lake and Rothchild provide an analytic skeleton on which to build a narrative like Levinger and Lytle's triadic structure. Fearon and Laitin provide further analysis by looking at what leads to interethnic cooperation (1996). In-group policing of behavior, and systems for inter group interaction that are recognized across group lines allow for information to flow, mitigating against risks associated with information failures (1996).

While much of this work was replaced in primacy by theories focusing on exogenous variables of conflict (e.g. Collier and Hoeffler 1998, 2004, Fearon 2004, Buhaug and Rød 2006), the emergence of ubiquitous mobile telephony and internet enabled devices has allowed groups and individuals to project exceptionally fine grained information onto databases and into platforms such as Twitter. These kinds of information systems are proving potentially able to bridge the problems associated with the aggregate data used in economic and geographic analyses of conflict, and from an operational standpoint can allow researchers to effectively

research the assumptions of Fearon and Laitin that posit inter group tendencies toward cooperation due to built in social mechanisms for decreasing information asymmetries.

Communication Technology for Development and Conflict Management

Perhaps the most important thing about mobile communication technology and digital aggregating systems is that they provide a system that can handle fine grained data about exogenous variables in a way that makes information sharing across groups easy and manageable at a technical level. This section will cover a basic history of "ICT4Peace"[3], applicable technologies, and how they integrate through the mobile telephonic system.

The concept of ICT4Peace is rooted in the longer history of "ICT4D"[4] which first came into the lexicon of development in the early 1990s when email and computing were expanding in the public sphere. Richard Heeks refers to this time period as ICT4D 1.0, when the focus was on the development of computer centers paid for with large aid budgets, demanding large scale infrastructure which proved unsustainable as a mechanism for development (2009). Heeks would claim that we have reached ICT4D 2.0 which is being driven my emerging mobile technology (2009), and 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 can be found. More common is what is referred to as a feature phone. It can send and receive phone calls and text messages, and has a camera, but

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[3] Information Communication Technology for Peace

[4] Information Communication Technology for Development

cannot connect to the internet the way a smart phone can. At the lowest level, and most common in the developing world are basic dual-band phones. These can only make calls and receive text messages; they lack color screens and cameras. These are of course the most common phones in the developing world, and because of this many of the tools we'll look at in this section are optimized to work with these most basic phones.

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. with pre-indentified reporters feeding information to analysts at the U.S. Holocaust Memorial Museum where data is loaded onto Google Earth[5], 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; suddenly anyone with a mobile phone could report on an event and it could be publicly displayed.

This is a good place to talk further about Ushahidi, since it was the first big public mapping platform to be used for conflict management and analysis. The original 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

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[5] See earlier discussion of the Darfur mapping project at the USHMM in the footnote on Page 1

be able to see (Ushahidi, 2011). Since then, Ushahidi has been used to respond to victims of Haiti's eathquake (2011), and to track the violence in Libya during the uprising against the Gaddafi regime (Meier, 2011). Along with being the first of its kind, it is also important 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).

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 (2011). A case study of mobile phones being used in peacekeeping operations is in the Democratic Republic of Congo's MONUC mission. Peacekeepers used mobile phones to communicate and receive information from local actors about militia activity and violence (2011).

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[6]. Continuing the theme of mobile telephony as the core technology, these social media platforms are most abundantly used in the developing world

[6] 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.

through mobile phone networks. People with smart phones 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 drastically under developed given 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, which is very much the darling of the ICT4Peace sector; 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 and ethno-polity, we will analyze why the mobile phone is such a powerful tool for governance and conflict management in Kenya and lay out the caveats of the logic that we will formalize in the following section.

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 2002, Fearon 2004, Gurr 1970, Gurr 1993, Levinger and Lytle 2001). While it is logical to assume that the information asymmetries and security dilemmas are driven by the risk that a group will not have access to good and services, these two tracks have usually been analyzed separately using different methods and assumptions. One track is using empirical evidence of conflict occurence to determine security dilemma-driven event probability (e.g. Bueno de Mesquita 1980), while the other track focuses on exogenous variables, generally using regression analysis and comparative and historical methodology (Collier and Hoeffler 1998, Gurr 1970, Levinger and Lytle 2001).

Because of this opportunities for integrating these two tracks have been limited, but with the emergence of mobile communications, public digital maps and social media, we now have an information regime that can handle event data and qualitative information simultaneously. While this has been put to work in the operational realm, formalizing our assumptions about the effect of these information systems has not been as rigorously explored theoretically. What we do know is that Kenya has been a particularly successful country when it comes to integrating technology into the governance and conflict prevention structure. 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 so successful in the Kenyan conflict management sphere as well as providing us with a set of factors to build a basic formal model from.

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 in the formal model that we are representing a discrete event and not a full-scale war. 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, or is it something manufactured by the political or elite classes to maintain political strength?

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 high 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 correlated 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 acting as a correlate (ibid).

Ethnic violence can also be seen as a manufactured function of political power projection. While pre-colonial Kenya saw inter-ethnic violence, the British used ethnic identity in a divide

and conquer approach to controlling Kenya (Holmquist and Ford 1994). This method of divide and conquer was adopted by 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 fine, 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 clientalism to keep them in power, in what amounts to winner-take-all election process (Mueller 2008). In many ways parties are programmatically politically indistinguishable, and use shifts in ethnic group positioning to maintain power over different voting blocs (Mueller 2011). It could be thought of as the Kenyan equivalent of gerrymandering. It has always led to some level of violence, but what we saw 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 by political elites, which focus on risks associated with inclusion and access to goods and services create a security dilemma between ethnic groups that solidifies voting blocs

for political leaders. This logic is what we will use to frame a formal model, which could help explain the positive impact that mobile technology is having on the governance and peacebuilding sectors of Kenya.

Logic, Caveats and Formal Model of Mobile Tech and Conflict Dynamics

Since Kenya's political dynamics were only used to be illustrative of certain communication and information systems within a polity, we should not over value the formal model we will develop and we should not assume that it is absolutely descriptive of Kenya's political or communication spheres. What we do expect from the model is to have a basic systematic understanding of the impact that increased communication between groups and different levels within society can have on the prevention of political violence. Thus, our assumptions 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.

From these caveats we assume that a violent event occurs at a particular time, and that the polity can prevent or lessen the impact of violence if they are able to communicate. In effect, violence is akin to the manufacture of a conspiracy, which is most likely to be successful when fewer actors are knowledgeable of the event (Wilson 2011). From Wilson's work on quantitative risk analysis, we can use his assumption that the likelihood of a conspiracy event is proportional to expected impact and number of actors with knowledge of the event. We start with Wilson's base variables for the likelihood of a conspiracy succeeding:

$$p^n \ \& \ An$$

Where p^n is the probability of an event based on the number of actors (n), and A(n) is a proportionality constant that defines the impact of an event relative to number of actors involved. From this we can create a probability function to describe violence based on our discussion of Kenyan political violence and mobile telephony's capacity to decrease the likelihood of violence:

$$p = (An)^{(1/n)-1}, A < n$$

In this function (p) equals the probability of an event as a function of impact (A) and the number of actors involved in the process (n). As (A) and (n) increase the probability of an event decreases proportionally. In this model (A) must always be smaller than (n); when A = n in the function p = 1 (100% likelihood of success), and when A > n we get (p) > 1 which is logically impossible. With that in mind, we will explore this dynamic mathematically. In the first test we will assume that no one is aware of political manipulation or has no means for countering it. We will start with five actors achieving a conspiracy with a success rate of 90% (p=.9). This will give us (A), a proportionality constant for impact, to later test probabilities of event likelihood:

$$.9 = (A5)^{(1/5)-1}, A = .22$$

What we see is that an event with 90% likelihood and an impact of .22 requires five or fewer conspirators. To keep this discussion framed around a tangible event, let us assume that .22 is an event equal to the 2007 election violence in Kenya. Since most Kenyans do not support violence, the Ushahidi mapping platform is invented so that people can report violence using SMS text messages and these can be seen publicly on a digital map by local citizens as well as the international community as a response to event (A). At the next round of hypothetical elections, international actors have supported the development of the Ushahidi platform and there has been a push to make sure people know that they can use text messages to report violence and communicate among each other at the local level. The same political actors are involved in trying to perpetuate violence, but with the increased use of mobile phones the number of actors involved in the election process has grown. What is the likelihood of an event

occurring that has the same impact (.22) when 25 actors are involved in the communication process (5 original political actors, plus 20 local level leaders):

$$p = (.22(25))^{(1/25)-1}, p = .19$$

Increasing the number of actors who may or may not share the original five political actors desire for political violence by twenty has taken the probability of a .22-level event from 90% to 19%. Another round of hypothetical elections comes up, and more people are involved in the reporting process, now with buy-in from stakeholders including the international community and government. Now there are 130 actors in the communication system:

$$p = (.22(130))^{(1/130)-1}, p = .03$$

We now have an event probability of 3%, effectively zero if we are talking about a complex event that only happens once every four years, such as manufactured election violence. This dynamic is logically in line with Axelrod's assumption that given enough time, large enough N, and the ability to communicate, groups will find ways to cooperate and resolve conflict in asymmetric information environments (2006). The results of this model indicate the value of access to decentralized communication systems in environments where the goal is to prevent violence, but review of the risks associated with this kind of information regime must be considered as well.

Risks and Problems with the Model

The most significant problem with the model is that it is nearly impossible to demonstrate empirically using quantitative data. We have to assume that actors are static and it realistically cannot account for the complex interplay of information across political parties, ethnic groups, and unpredictable environmental variables ranging from bad harvests, climate shocks and neighborhood effects (e.g. stability of Somalia, South Sudan, etc). What it gives us is a logical frame for integrating inter-group competition and cooperation theories with observations of how mobile telephonic systems could support inter-group cooperation and decreased risk of violence. This model should not be assumed to describe all the complexity at work in Kenya or any other country when engaging in peacebuilding, governance or conflict prevention processes.

There are also problems with transference between cases. We selected Kenya because it is considered the best test case of how emerging mobile technology can have exceptional effects on 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 UN 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 could be replicated in the Democratic Republic of Congo (DRC) due to a lack of infrastructure, different geographic and demographic factors, and a centrally controlled political landscape. For all intents and purposes the same technology at work in Kenya would probably have a negligible impact on the recent elections in DRC.

Worse than negligible impact is the risk that mobile technology could be used by malcontents or dictatorial regimes to more effectively incite and organize violence, while controlling the citizenry more effectively (Morozov, 2011). Raftree provides eleven concerns about technology-driven development and peacebuilding, which address problems related to social and cultural assumptions about communication and issues surrounding infrastructure (2010). The model proposed assumes that any country where one of these kinds of technical projects is undertaken has basic connectivity and technical capacity, and most importantly that the narrative of potential violence is not ubiquitous or inherent to the politics of the country, but is manufactured leading up to discrete events such as elections. 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. 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 *Akazu* and *Interahamwe* groups who led the violence.

Finally, this model does not aim to describe all the types of violence in Kenya. We recognize that there are different levels and modalities of violence that can be observed in the case of Kenya; we selected election violence because the applications of technology have focused on this space. Mobile phones and access to communication therefore may have limited or no impact on violence unrelated to elections.

Next Steps and Initial Conclusions

Given the very general nature of the probability function this paper proposes, and the associated problems with gathering empirical evidence for demonstrating it, an alternative method for

further expanding this paper would be to employ a mixed methods approach using structured interviews with Kenyan leaders at the local and district level to better understand why they are making use mobile technology for conflict prevention. Using these interviews, we can then revisit the model and make adjustments to its logical assumptions, and then refine our interview methodology and content. This kind of fine-grained data 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 explosion of mobile telephony, social media and real-time mapping technology is the opportunity to completely change the political dynamics in democracies, giving voice to millions of citizens who otherwise would be silent. But there is a dark side, as Morozov to passionately points out (2011), and it is incumbent on professionals in the conflict resolution and management field to have a thorough understanding of the complex social and political dynamics at work in a country before adding mass communications capacity to the situation. What we know is that these tools are already being used in practice. A concerted effort to develop a deeper theoretical understanding of the implications for using mobile technology, social media and mapping for conflict management, governance, and development could have far reaching positive affects for millions of people working to achieve peace and stability in the countries the call home.

Bibliography

1. Axelrod, Robert. (2006). *The Evolution of Cooperation: Revised Edition*. New York: Basic Books

2. Barkan, Joel D. (2004). "Kenya After Moi" *Foreign Affairs*. 83:1 87-100

3. Bueno de Mesquita, Bruce. (1980). "An Expected Utility Theory of International Conflict: An Exploratory Study" *American Political Science Review*, 74: 917-31.

4. Buhaug, Halvard and Jan Ketil Rød. (2006). "Local Determinates of African civil wars" *Political Geography*. 25: 315-355

5. Clauswitz, Carl von. (1982). *On War*. J.J. Graham ed. New York: Penguin

6. Collier, Paul and Anke Hoeffler. (1998). "On Economic Causes of Civil War" *Oxford Economic Papers*. 50:4 563-573

7. Collier, Paul and Anke Hoeffler. (2004). "Greed and Grievance in Civil War" *Oxford Economic Papers*. 56:4 563-595

8. Dorn, A. Walter. (2011). *Keeping Watch: Monitoring, Technology & Innovation in UN Peace Operations* Tokyo: United Nations University Press

9. Fearon, James D. and David D. Laitin. (1996). "Explaining Interethnic Cooperation" *The American Political Science Review*. 90:4 715-795

10. Fearon, James D. (2004). "Ethnic Mobilization and Ethnic Violence" Draft Chapter, *Oxford Handbook of Political Economy*

11. Gurr, Ted Robert. (1970). *Why Men Rebel*. Princeton: Princeton University Press

12. Gurr, Ted Robert. (1993). *Minorities at Risk: A Global View of Ethnopolitical Conflicts*. Washington, D.C: USIP Press

13. Hanson, Stephanie. (2008) "Understanding Kenya's Politics" *Council on Foreign Affairs Backgrounder*. Available at: http://www.cfr.org/kenya/understanding-kenyas-politics/p15322 Accessed December 5, 2011

14. Heeks, Richard. (2009). "The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development?" *Development Informatics Working Paper Series*. Paper No. 42

15. Hewitt, Joseph, Jonahthan Wilkenfeld, Ted Robert Gurr. (2007). *Peace and Conflict 2008*. CIDCM. University of Maryland

16. Holmquist, Frank and Michael Ford. (1994). Kenya: State and Civil Society the First Year after the Election. *Africa Today*. 41:4 5-25

17. _____ (1992). Kenya: Slouching toward Democracy. *Africa Today*. 39:3 97-111

18. Horowitz, Donald. (1985). *Ethnic Groups in Conflict*. Berkeley: University of California Press

19. Huntington, Samuel. (1993). "The Clash of Civilizations" *Foreign Affairs*. 72:3 22-49

20. Kaufman, Stuart J. (2006). "Symbolic Politics or Rational Choice? Testing Theories of Extreme Ethnic Violence" *International Security*. 30:4 45-86

21. Lake, David and Donald Rothchild. (1996). "Containing Fear: The Origins and Management of Ethnic Conflict" *International Security*. 21:2 41-75

22. Levinger, Matthew and Paula Franklin Lytle. (2001). "Myth and mobilization: the triadic structure of nationalist rhetoric" *Nations and Nationalism*. 7:2 175-194

23. Levy, Jack. (2007). "International Sources of Interstate and Intrastate War" from *Leashing the Dogs of War*. Crocker, Hampson and Aall eds. Washington, D.C: USIP Press

24. Maier, Patrick. (2011). "Crisis Mapping Libya: This is no Haiti" *iRevolution* Available at: http://irevolution.net/2011/03/04/crisis-mapping-libya/ Accessed December 5, 2011

25. Martin-Shields, Charles (2011). "Power to the People: The Risk and Rewards of Mobile Technology in Governance Development" *The TechChange Blog*. Available at: http://techchange.org/2011/04/21/power-to-the-people-the-risk-and-rewards-of-mobile-technology-in-governance-development/ Accessed December 4, 2011

26. Morozov, Evgeny. (2011). *The Net Delusion: The Dark Side of Internet Freedom* Philadelphia: PublicAffairs

27. Mueller, Susanne. (2011). Dying to Win: Elections, political violence, and institutional decay in Kenya. *Journal of Contemporary African Studies*. 29:1 99-117

28. _____ (2008). The Political Economy of Kenya's Crisis. *Journal of Eastern African Studies*. 2:2 185-210

29. Ndegwa, Stephen N. (2003). "Kenya: Third Time Lucky?" *Journal of Democracy*. 14:3 145-158

30. Okombo, Okoth ed. (2011). *The Invisible Violence in Kenya: A Case Study of the Rift Valley and Western Regions* Commissioned by the Konrad Adenauer Stiftung, Nairobi, Kenya

31. Raftree, Linda. (2011). “11 concerns about ICTs and ‘social media for social good’” *Wait… What?* Available at: http://lindaraftree.wordpress.com/2010/09/18/11-concerns-about-icts-and-social-media-for-social-good/ Accessed December 6, 2011

32. Thycidides. (1972). *History of the Peloponnesian War.* M.I. Finley ed. New York: Penguin

33. UNDP. (2011). “Voting, not Violence, in Kenya” Available at: http://www.beta.undp.org/undp/en/home/ourwork/crisispreventionandrecovery/successstories/Voting-not-violence-in-kenya.html Accessed December 5, 2011

34. Ushahidi. (2011). Case Studies from Ushahidi Website. Available at: www.ushahidi.org Accessed December 4, 2011

35. Wilson, Joseph. (2011). “Why Conspiracy Theories are Bunk” *Entsophy* Available at: http://www.entsophy.net/blog/?p=42 Accessed December 6, 2011