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ICT and large-scale mobilisation in sub-Saharan Africa

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Sammanfattning

Vissa forskare hävdar att informations- och kommunikationsteknologi (IKT), såsom mobiltelefoni och Internet, kan vara ett effektivt verktyg för att mobilisera storskaliga demonstrationer. Deras argument baseras på dessa mediers globala räckvidd, låga teknologiska användartröskel, avtagande kostnader och effektiva produktionsmöjligheter, tillsammans med omedelbar distribution och återkoppling. I Afrika söder om Sahara är dessa attribut dock inte nödvändigtvis applicerbara. Den här studien försöker att identifiera nyckelvariabler ur den pågående bredare debatten om IKT:s användning vid storskalig mobilisering och dessutom identifiera variabler som är relevanta för Afrika söder om Sahara.

För att beskriva IKT:s roll vid storskalig mobilisering i den lokala kontexten söder om Sahara utvecklar den här studien en modell som beskriver olika vägar för medborgare att uttrycka eventuellt missnöje; antingen via demonstrationer eller via aktivism online. Modellens olika komponenter är kopplade till de identifierade variablerna.

För ett första test av modellen valdes två länder ut: Nigeria, ett land med en hög andel internetanvändare jämfört med övriga Afrika söder om Sahara, och Etiopien, ett land med en låg andel internetanvändare.

Nyckelord: Afrika söder om Sahara, protester, IKT, internet, mobiltelefoni, Nigeria, Etiopien

Summary

Some scholars claim that ICTs can be an efficient means of mobilising large-scale protests commonly base their argument on the global reach, low technology threshold, diminishing costs and extremely efficient production, combined with instant distribution and feedback, of these new media. In the sub-Saharan context, however, not all of these attributes necessarily apply. This study seeks to identify key variables from the on-going broader debate regarding the role of ICTs during large-scale mobilisations, and to supplement those with a specification of relevant variables for the sub-Saharan context.

To understand ICTs' role during large-scale mobilisations in the sub-Saharan context, the study has developed a model that describes different means by which citizens can channel their discontent in the physical arena and the information sphere. The components in the model are composed of the identified variables.

In an initial trial of the model, two countries were selected: Nigeria, a country with a high number of Internet users per hundred inhabitants as compared to the other countries in sub-Saharan Africa, and Ethiopia, a country with a low number of Internet users.

Keywords: Sub-Saharan Africa, protests, ICT, Internet, mobile phone, Nigeria, Ethiopia

Preface

This report has been produced within the National Security in the Information Society (SPIS) project at FOI. This project studies the complex interplay between our modern information society and national security, an evolving field that has attracted considerable attention in the wake of the Arab spring.

The report has benefitted from the comments of Richard Langlais, who made valuable remarks as a reviewer.

Stockholm, July 2013
Ulrik Franke, SPIS project manager

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Acronyms

ICT	Information and Communication Technologies
ISP	Internet Service Provider
ITU	International Telecommunication Union
FHI	Freedom House Index
FOI	Swedish Defence Research Agency
GDP	Gross Domestic Product
GSM	Global System for Mobile Communications
HDI	Human Development Index
POA	Political Activism Online
RSF	Reporters Sans Frontières
SMS	Short Message Service
SPIS	National Security in the Information Society
UNDP	United Nations Development Programme
3G	Third generation mobile telecommunications

1 Introduction

In the early months of 2011, an unprecedented wave of protests demanding greater political freedoms, and in several countries regime change, swept across much of the Arab world. In Tunisia, Egypt, and Libya, long-standing autocrats were toppled, and in other countries seemingly well-established authoritarian regimes appeared increasingly unstable in the face of growing opposition movements. The role of information and communication technologies (ICTs) in popular mobilisation has been hotly contested. Whatever the outcome of the latter, the uprisings and the ensuing debates are demonstrating that the interplay between ICTs and political events is an increasingly important dimension of security policy studies.

Those who claim that ICTs can be an efficient means of mobilising large-scale protests commonly base their argument on the global reach, low technology threshold, diminishing costs and extremely efficient production, combined with instant distribution and feedback, of these new media.[1]In the sub-Saharan context, however, not all of these attributes necessarily apply. For example, many technologies require that their users have already acquired certain skills, first and foremost basic literacy. Africa, on the other hand, has the highest share of people, worldwide, lacking literacy skills, which in turn implies that large segments of the population are not fully able to take advantage of these same technologies.[2]

Current theories of how access to digital technology affects the potential for mass-mobilisation have largely been based on the conditions in nations with relatively well-developed information infrastructure. As a result, these theories to a large extent exclude the experience of sub-Saharan Africa, where access to Internet is scarcer and more expensive, in both absolute and relative terms, than anywhere else in the world. Recent studies of Internet access in sub-Saharan Africa, for example, have found that in Sudan over one-third of the minimum wage, and in Mali almost two-thirds, must be spent in order to obtain a wired Internet broadband connection.[3] Limited Internet coverage, combined with high

[1] See for example Anduiza, et al. 2009, 'Political participation and the Internet' *Information, Communication & Society*, 12:6, pp. 860-878; Olorunnisola and Martin (2012) discuss attributes of new media technologies; see also Tufekci, Zeynep and Wilson Christopher (20012) 'Social Media and the Decision to Participate in Political Protest: Observations From Tahrir Square', *Journal of Communication*,Vol. 62, pp. 363–379

[2] World Bank (2013), 'World Development Indicators – Literacy rate', on the Internet: http://data.worldbank.org/indicator/SE.ADT.1524.LT.ZS. (retrieved 15 May 2013)

[3] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013)

user fees for both internet subscriptions and mobile phones, leads one to surmise that the opportunities for using ICTs as a tool for mobilisation are restricted.

In spite of those conditions, during the past decades sub-Saharan countries have seen the mobilisation of numerous large-scale protests. A further complication for theory is that the African continent is now entering an interesting era of rapid expansion of ICT access. Indeed, since 2007, Africa is the fastest growing mobile market in the world.[4] There have been major investments in fibre-optic cables and, since 2012, all the coastal states in sub-Saharan Africa are served by submarine cables, all of which is gradually making the use of ICTs more accessible and affordable.[5] At the same time, the gross domestic product (GDP) per capita in a number of countries is growing fast, while young people are becoming more and more educated.

Many pundits were surprised by the fast progression of the early stages of the Arab revolts[6], even though it was known that a number of underlying factors, including access to ICTs, had been in place for a long time. Given the current lack of comprehensive research on the role of ICTs in social movements in the sub-Saharan context, there is a risk that outside observers may similarly be caught off-guard by rapid mobilisation and societal change in the rest of Africa.

1.1 Scope

This study was conducted as part of the Swedish Defence Research Agency's (FOI) project, "National Security in the Information Society" (SPIS). SPIS is one of FOI's internal competence-building projects, and is intended to develop methods for studying the interplay between ICTs and social and political events, as well as to explore the role and functions of modern ICTs in international relations.

As a part of SPIS, the study reported on here has a three-fold general aim. The first aim is to create an understanding of the role and development of ICTs in sub-Saharan Africa. The second is to identify key variables from the on-going

[4] Zanello, Giacomo and Maassen, Paul. (2011) 'Strengthening citizen agency and accountability through ICT: An extrapolation for Eastern Africa', *Public Management Review*, Vol. 13 Issue 3, pp. 363–382

[5] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013)

[6] The term that appears to have gained currency across the Western world is "Arab Spring". This term is contested since it can be perceived as a single revolt that only occurred during a short period of time. Thus, the report uses the term "Arab revolts".

broader debate regarding the role of ICTs during large-scale mobilisations, and to supplement those with a specification of relevant variables for the sub-Saharan context. The variables are presented in Appendix A, section 1-5. Finally, this study aims to develop a model that describes different means by which citizens can channel their discontent in the physical arena and the information sphere. Although the study is still underway, there has been sufficient progress that an interim report on the status of this part of the work so far can be useful both for the reader and for those involved in the study. We look forward to any reflections or other feedback that may enhance the work that still remains.

One of the study's works-in-progress is the design of a model; it is not fully developed nor tested, yet, but it has reached a point where its potential usefulness is already discernible. More specifically (when completed), in contributing to the project's objectives, the model is intended to be able to provide a snapshot of an on-going protest. It includes components that could influence the means of mobilising large-scale protests.

The components are composed of the identified variables; the variables are described in Appendix A. At this point, the model is not envisioned as being able to establish causal relations. However, with the large diffusion of ICTs over the last decade, as time and developments proceed, it will be interesting to see what happens to the other components of the model as the ICT access in a country increases.

In an initial trial of the model, two countries were selected: Nigeria, a country with a high number of Internet users per hundred inhabitants as compared to the other countries in sub-Saharan Africa, and Ethiopia, a country with a low number of Internet users. Both countries recently underwent post-election protests with different levels of intensity (Nigeria 2007 and 2011, and Ethiopia 2005 and 2010). The calculations used to elaborate the cases can be found in Appendix B.

1.2 Outline

Chapter Two describes the theoretical framework of the model, this is where the notion of components, variables, and their interactions. Chapters Three and Four present an application of the model to the selected case studies, Nigeria and Ethiopia. Chapter Five provides a discussion of how the model can be improved and proceeds with some reflections and grounds for further analysis of the topic of ICTs and large-scale mobilisations in sub-Saharan Africa. Chapter Six presents a number of concluding remarks.

2 A model of ICT and large-scale mobilisation

2.1 Traditional mass communication and large-scale mobilisation

Large-scale protests pre-date ICT. Throughout history people have mobilised through interpersonal ties, relying on word-of-mouth communication and as a result of face-to-face encounters. Natural networks such as those constituted by families, neighbours and religious congregations, as well as different types of more formal organisations, were used to coordinate large-scale protests. Collective workplaces, such as factories, and markets, where basic needs were met, were natural meeting places where people could exchange information and opinions. Accordingly, the spatial location was an important factor and consequently popular protest usually occurred locally.

During a traditional mobilisation process, which can of course occur even today, interpersonal ties create a direct link from the individual's motivations for protesting—labelled in the model as *drivers* and *enablers*—to the *protest* (see Figure 1). People join their relatives, friends and neighbours in publicly expressing their discontent.[7] In the model, a driver is a variable that creates a demand for change, whereas an enabler is a variable that provides for a supply of ready protestors. Typical examples are, respectively, poor governance and unemployment (see Appendix A, section 1).

Generally, humans place greater confidence in direct observations than in impressions conveyed by someone else, such as the media.[8] People observing a street protest may thus be easily influenced by that event as their impressions reinforce their personal drivers and enablers, the protests grow. The link between protests and drivers and enablers is bi-directional.

[7] See for example Scacco, Alexander (2010) 'Who Riots? Explaining Individual Participation in Ethnic Violence in Nigeria', Ph.D. Dissertation, Columbia University, 2010. The dissertation shows that individuals, rather than being motivated by grievances alone, are more likely to participate in riots when they are members of neighbourhood social networks.

[8] Olorunnisola et al. (2012) 'Influences of media on social movements: Problematizing hyperbolic inferences about impacts', *Telematics and Informatics*, p. 6

Research on contentious politics commonly distinguishes between protests carried out under democracy and those carried out under authoritarianism.[9] The organisation of predominantly non-violent protest by social movements is a crucial element of mainstream politics under democratic regimes, intended to voice dissent from the political status quo.[10] This pattern can be difficult to apply to the sub-Saharan context, however. The very foundations of the states are often instable and political conditions can change quickly. For example, until recently Mali was considered to be a consolidating democracy.

Autocracies, as well as semi-authoritarian regimes, tend to be intolerant of any opposition to, or contestation of, power. *Security forces* can arrest protestors, or use violence against them. Large-scale mobilisation activities are often also assumed to be problematic in liberal democracies.[11] The police in democratic countries have the responsibility for maintaining control over large-scale mobilisation and seek to maintain "public order". The model represents this as a one-way arrow, originating from the component called *countermeasures* to the *protests* component (see Figure 1). The size of the arrow depends on the security forces' efforts of trying to counter the mobilisation process.

The introduction of traditional mass media, such as radio, newspaper, television, enabled new methods of mobilisation. Through mass media, information can travel faster and reach a larger number of people across greater distances. Nevertheless, the introduction of technologies has hardly eroded face-to-face means of mobilisation. To show this in the model, in addition to the arrow between *drivers and enablers* and *protests,* a bi-directional arrow is added when *old media,* i.e. traditional mass media, are used for large-scale mobilisation.

Regimes may also use countermeasures to influence the use and effectiveness of mass media in inciting mobilisation; this is shown with an originating arrow from the *countermeasures* component to the *old media* component.

[9] Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution', Discussion Paper, *Deutsches Institut für Entwicklungspolitik*, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013)

[10] Meyer, D. S. and Tarrow S. (eds.) 1998, The social movement society: contentious politics for a new society,Oxford, Rowman & Littlefield

[11] Martin, Brian (1994) 'Protest in a liberal democracy', *Philosophy and Social Action,* Vol. 20, pp. 13-24 on the Internet, http://www.uow.edu.au/ ~bmartin/pubs/94psa.html (retrieved 5 July 2013)

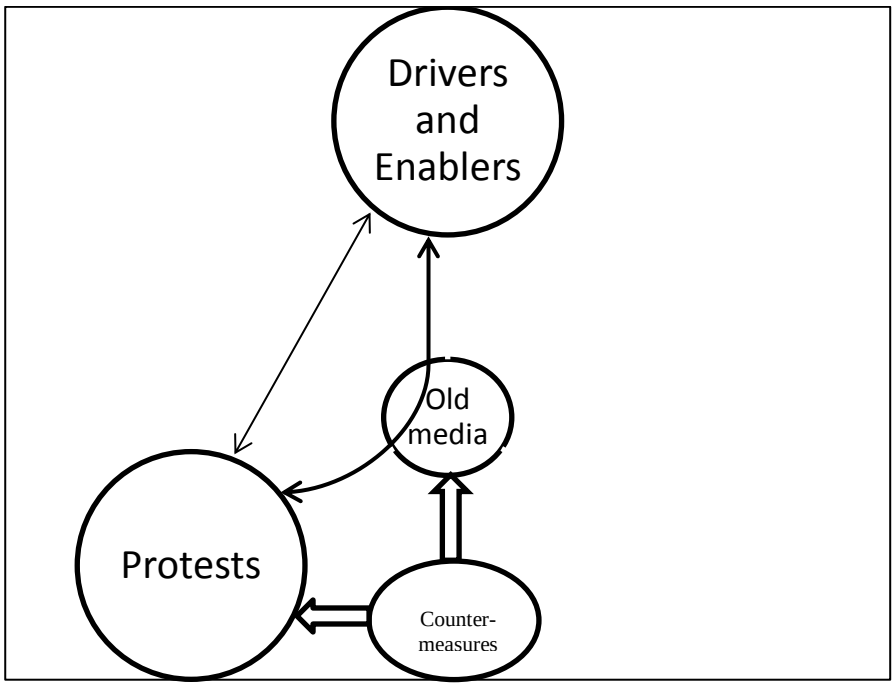

Figure 1 Traditional mass media and large-scale protests

Depending on the availability of traditional mass media in a country, combined with the socioeconomic conditions, protesters may be able to use mass media to mobilise street protests. Its successful use is not guaranteed, however. For example, due to poverty and lack of electricity, the use of modern home appliances may be scarce among the population, which would make efforts to spread information via television a poor option.

A different set of *drivers and enablers* will also influence the choice and opportunities for mobilisation of using either traditional mass media, face-to-face means, or both. During the Rwandan genocide in 1994, for example, the mobilisation of its participants occurred almost equally in the face-to-face dimension and via the airwaves, through the active deployment and participation of partisan radio networks.[12]

To recapitulate, with the introduction of technologies for mass media, a government's efforts to control the flow of information and hinder large-scale

[12] Olorunnisola et al. (2012) 'Influences of media on social movements: Problematizing hyperbolic inferences about impacts', *Telematics and Informatics*, p. 8

protests also need to adjust to the same new technologies in devising countermeasures.

2.2 ICT and large-scale mobilisation

Similar to traditional mass media, new media platforms, such as mobile telephone text messaging ("SMS," or "short message service"), the Internet and other digital social media can be used to directly target prospective participants for large-scale mobilisation. Unlike traditional mass communications, the use of mobile phones and the Internet facilitates individualised mass communication, allowing user-generated content to be shared with a virtual community. With the shift from "one-to-many," to "many-to-many," communication, users who coordinate large-scale mobilisations can bypass governments and the more mainstream media.[13]

Some scholars have argued that new ICTs have also significantly diminished the transaction costs of protest mobilisation by changing the way in which information can be published.[14] Anduiza, et al. (2009), cautioned that while new ICTs have the potential to reduce the cost of participation, their effective use depends on the participants' online skill sets and on Internet access. The usage of ICTs in sub-Saharan Africa is among the most expensive in the world, however, and the high cost of accessing new ICTs could exclude use by marginalised and disadvantaged groups. In addition, the African countries have variegated access to the Internet and to prerequisites such as electricity, affordable computers and Internet service providers' (ISPs') services.

The penetration of radio in sub-Saharan Africa is still presumed to surpass that of the Internet.[15] Even though digital media are growing dramatically across the

[13] Rheingold, Howard (2003), *Smart Mob: The Next Social Revolution*, (United States of America, Perseus Publishing)

[14] See for example Anduiza, et al. 2009, 'Political participation and the Internet', *Information, Communication & Society*, 12:6, pp. 860-878; Breuer, Anita (2012) "The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution", Discussion Paper, Deutsches Institut für Entwicklungspolitik, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013); Benkler, Y., 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, (New Haven, Yale University Press); Bimber, B., Flanagin, A., Stohl, C., 2005. Re-conceptualizing collective action in the contemporary media environment. Communication Theory 15 (4), 365–388.; Earl, J., Schussman, A., 2003. The new site of activism: on-line organizations, movement entrepreneurs, and the changing location of social movement decision-making. Research in Social Movements, Conflicts and Change 24, 155–187.

[15] Olorunnisola et al. (2012) 'Influences of media on social movements: Problematizing hyperbolic inferences about impacts', *Telematics and Informatics*, p. 12

region, there is little disagreement that radio is still the dominant mass-medium.[16] Radio is particularly suited as a communication tool in regions with low literacy rates.[17] The mobile telephone is perhaps the only new communication technology whose penetration comes close to radio's and has been shown to be effective for mobilisations.[18] By means of text messaging, a vast network of individuals can communicate rapidly and with little hierarchy, or central direction, in order to gather at a certain location to protest, for example. Howard Rheingold calls this phenomenon a "smart mob".[19]

Regarding other media, Anduiza, et al. suggests that a study of the influence of the Internet on political participation must include appraisal of in three categories of influence: (1) activities that can be executed efficiently both on- and offline; (2) activities that can only be carried out online: and (3) activities that can only be executed offline. In keeping with the authors' approach, the model that is under development for studying the role of ICT and large-scale mobilisations will include these three options for organising popular protests.[20]

Taking the African context into consideration, the *ICT* component in the more elaborated model (see Figure 2) will be composed of both new and old media. When an ICT is used to address an individual person directly, the relationship arrow goes from *drivers and enablers*, through the *ICT* component, to the physical arena, that of the *protests*. The arrow is bi-directional, since people who are out protesting are able to use ICT tools to contact others and encourage them to join the protest.

Politicisation of the security sector is still a common feature in the sub-Saharan states and the operational mandate of these politicized forces is regime protection rather than citizen protection.[21] In the model, the size of the red *countermeasures* arrow will depend on the extent of the security forces' repression of protesters. This could also include suppressing emerging protest movements by arresting key agitators.

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[16] See for example Thompson, A.(2009) 'Radio, convergence and development in Africa' *Centre for Media and Transitional Societies*, on the Internet: http://web.idrc.ca/en/ev-139447-201-1-DO_TOPIC.html (retrievied 24 June 2013)

[17] Myers, Mary (2009) 'Radio and Development in Africa: A Concept Paper,' *International Development Research Centre*, March 2009, p. 12.

[18] Olorunnisola et al. (2012) 'Influences of media on social movements: Problematizing hyperbolic inferences about impacts', *Telematics and Informatics*, p. 12

[19] Rheingold, Howard (2003), *Smart Mob: The Next Social Revolution*, (United States of America, Perseus Publishing)

[20] Anduiza et al. (2009) 'Poblitical Participation and the Internet – A Field ' *Information, Communication and Society*, Vol. 12, No. 6, pp. 860-878.

[21] Africa Center for Strategic Studies (2011) 'Africa and the Arab Spring: A New Era of Democratic Expectations', *Africa Center for Strategic Studies*, ACSS Special Report No. 1, on the Internet: http://www.cissm.umd.edu/papers/files/acss_special_report_1.pdf (retrieved 16 May 2013)

When protests, inspired by the "north African spring," broke out across sub-Saharan Africa in the first half of 2011, at the first signs of unrest, a number of governments sent the security forces to the streets, cordoned off key public spaces and arrested opposition politicians, journalists and civil society actors.[22]

2.2.1 Political activism online

The relationship between technology and society tends to be interactive, where technical communications infrastructure also influences the structures of social organisation and provides a format for political participation and activism. In this sense, there is an evolving political culture of the "Web 2.0".[23] This *political activism online* component (see Figure 2) can indirectly target people and increase awareness about protests in the information arena. This is possible since ICT can facilitate communication and coordination across both physical and social distance. Thus, it can mobilise people who were unable to organise, in places they were not able to mobilise in, before.[24]

Moreover, people can mobilise at speeds that were unattainable earlier.[25] It is assumed that the likelihood of an individual's being directed by an online mobilisation movement increases with the number of that individual's memberships in different online networks and the number of social relations they maintain on those networks, regardless of whether the person actively seeks protest-related information.[26]

In authoritarian regimes, individuals who are dissatisfied with a political regime may be reluctant to state their opinion openly, for fear of being sanctioned by the

[22] Smith et al. (2011), 'Will the Arab Spring read south?', *The Guardian* , 29 April 2011, on the Internet: http://www.guardian.co.uk/world/interactive/2011/apr/29/protests-arab-spring-africa-interactive, (retrieved 3 July 2013)

[23] See for example Zhang et al.(2010) 'The revolution will be networked: the influence of social networking sites on political attitudes and behavior', *Social Science Computer Review*, 28, 1, 2010, 75–92.

[24] Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution', Discussion Paper, *Deutsches Institut für Entwicklungspolitik*, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013)

[25] Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution', Discussion Paper, *Deutsches Institut für Entwicklungspolitik*, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013)

[26] Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution', Discussion Paper, *Deutsches Institut für Entwicklungspolitik*, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013)

state. It could be argued that this fear can be overcome via ICTs, which may be used to publicise the broad range of oppositional views.[27]

There are other techniques for large-scale mobilisations in authoritarian regimes; for example, opinions introduced via Twitter can be rapidly re-tweeted. It is important to remember that the mere act of tweeting, or posting updates, on social media does not have to constitute an act of dissent, per se, although this could be the case within certain specific socio-political contexts.

The link between *protests* and *political activism online* is bi-directional, since events from the physical arena can be blogged and video clips can be posted in the information arena so as to inform the world about the mobilisation (see Figure 2). In some political contexts, it can also protect protesters from harsher reprisals at the hands of the security forces.[28]

Not everyone agrees about ICT's potential for mobilisation; new media may just bring about even more individual passivity. Morozov (2011) calls this type of pseudo-activism "slacktivism," a form of "feel-good" activism that has little political effect. A large number of "likes" is no guarantee that planned demonstrations will be well-attended.[29]

Pessimists fear ICT's capability to polarise, as users seek out congenial relationships and bias-confirming information, which may prevent a new culture of debate from emerging. Generally speaking, the local context must be taken into account. The information arena never operates in a political or social vacuum, but is highly dependent on the specific socio-cultural context, Internet diffusion, quality of access, the degree of state censorship and differences in user behaviour.[30]

The political role of the Internet should not be exaggerated; most of what is available is entertainment-oriented and there is a balancing act between what can be considered to be online political activism and mere cacophony in the information arena. In particular, there is a wide debate on the relation between the affordances of social media technologies, and the materialities of the offline

[27] Defined by Christian Chritiansen (2011) as *techno-utopianism*, those who trumpet the virtues of new technologies such as Twitter and YouTube, linking, for example, the erosion of oppressive state power with access to and use of social media.

[28] See for example Khanfar, Wadah (2011) 'A Historic Moment in the Arab World', *TED Talks*, on the Internet: www.ted.com/talks/wadah_khanfar_a_historic_moment_in_the_arab_world.html (retrived 8 July 2013).

[29] Morozov, Evgeny (2011) *The Net Delusion: The dark side of Internet freedom* (New York, Public Affairs)

[30] Hanrath, Jan and Leggewie, Claus (2013) 'Revolution 2.0? The Role of Digital Media in Political Mobilisation and Protest', *Global Trends 2013*, Stiftung Entwicklung und Frieden, on the Internet: http://www.globale-trends.de/fileadmin/Redaktion/Globale-Trends_2013/gt_2013_hanrath_leggewie_en.pdf (retrived 8 July 2013)

world.[31] What there does seem to be consensus on is that not all mobilisation activities published online will lead to protests, as an inevitable result of a concurrent link between *drivers and enablers*, and *political activism online* (see Figure 2). The relationship can be two-way, since information about social unrest posted in the information arena could also reach a recipient who had not been intentionally targeted.

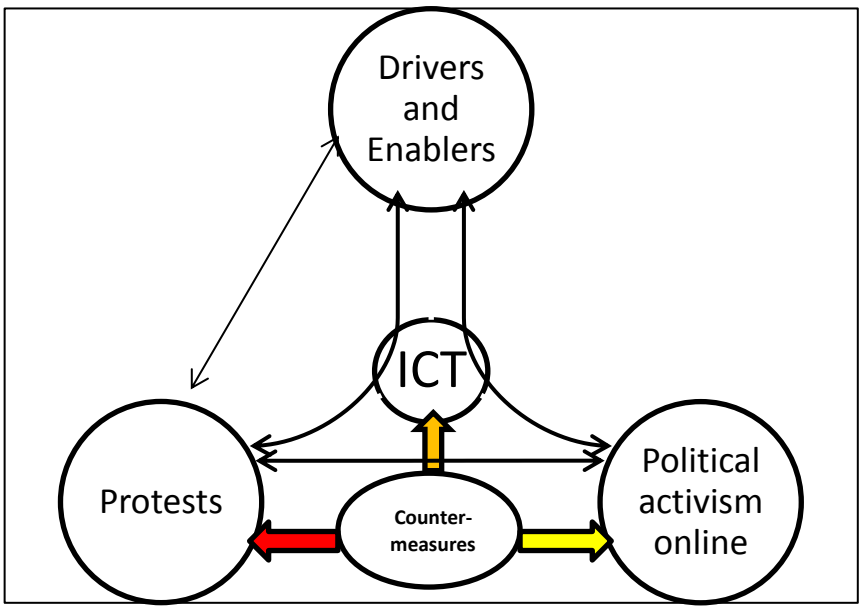

Figure 2 ICT and large-scale mobilisation

Olorunnisola and Martin's study (2012), which reviewed a number of cases, brings to the fore the likelihood that assumptions about the interpenetrating roles of traditional media and new ICTs in the activities of social movement organisations on the African continent are over-generalised. According to the authors, it is reasonable for now to infer that new ICTs are, at best, complementing the activities of social movements.[32] This means that the bi-

[31] Christensen, Christian (2011) 'Twitter Revolutions? Addressing Social, Media and Dissent', The Communication Review, 14:3, pp. 155-157, on the Internet: http://www.tandfonline.com/doi/pdf/10.1080/10714421.2011.597235 (retrieved 6 June 2013)

[32] Olorunnisola et al. (2012) 'Influences of media on social movements: Problematizing hyperbolic inferences about impacts', *Telematics and Informatics*, p. 12; see also Wasserman (2007)

directional arrow between *drivers and enablers* and *protests* will still represent an important role in the mobilisation of large-scale protest.

Due to large variations in Internet diffusion among the sub-Saharan countries and the fact that Internet penetration rates are progressing substantially, along with a simultaneous decrease in subscription prices, it is reasonable to assume that there will also be political activists in the online arena in certain parts of the continent.

2.2.2 ICT and countermeasures

Concerned with the power of new technologies to catalyse political change, many authoritarian regimes have taken various measures to filter, monitor, or otherwise obstruct, free speech in ICTs. According to the Freedom House report, *Freedom on the net* (2012), restrictions on Internet freedom continue to increase across a wide range of countries. These include restraining connectivity and infrastructure, blocking and filtering content that is critical of the regime and arresting users who post information that is deemed undesirable.[33]

In the model, the orange countermeasures arrow (see Figure 2) portrays counteracting activities such as *influencing the ICT infrastructure*. This includes internet tools for filtering and ownership control over Internet and mobile phone access providers.

The yellow countermeasures arrow represents activities *influencing the Internet content*. To counter the growing influence of independent voices online, an increasing number of states are turning to proactive manipulation of web content, rendering it more challenging for regular users to distinguish between credible information and government propaganda. Some regimes are covertly hiring large numbers of pro-government bloggers to tout the official point of view, discredit opposition activists, or disseminate false information about unfolding events. This practice was in the past largely limited to China and Russia, but during the last year it has been adopted in more than a quarter of the countries examined by Freedom House.[34]

[33] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013)

[34] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013).

Although the region still lags behind the rest of the world in both number and percentage of Internet users, sub-Saharan Africa has a history of media abuses and restrictions on freedom of the press, which makes the region appear to be a likely setting for equally restrictive Internet policies.[35]

[35] Heacock , Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, 2009, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 23 May 2013)

3 Nigeria

Figures 3 and 4 presents the initial trial of the model applied on the 2007 and 2011 post-election situation in Nigeria. The variables used in the model are presented in Appendix A, while the underlying calculations can be found in Appendix B. The following discussion in this chapter will confer the components in the model and of how well the calculations of variables describe those components.

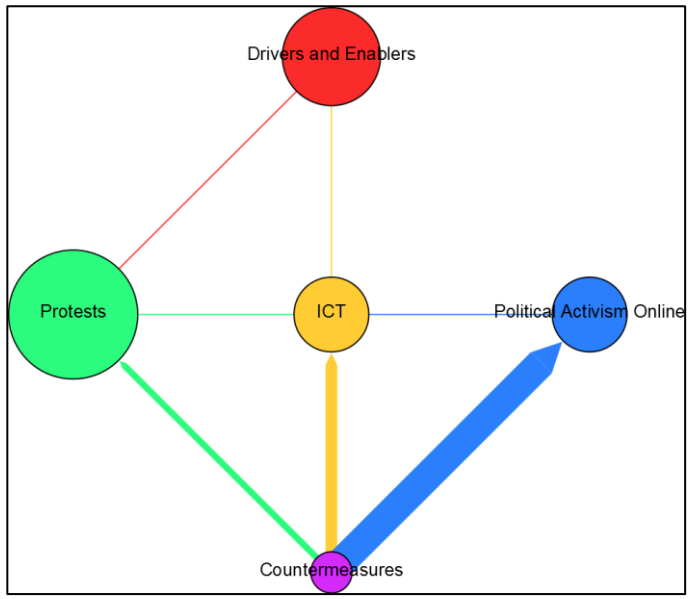

Figure 3 Nigeria 2007

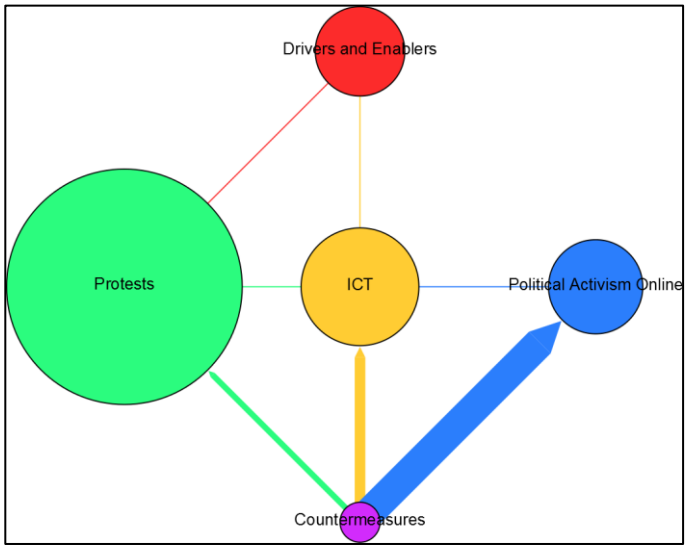

Figure 4 Nigeria 2011

Nigeria's fourth republic was founded in 1999, after a sixteen-year period of military rule; elections have since been held every four years. A potent mix of drivers and enablers of mobilisation have been present in Nigeria throughout this period: the rate of unemployment has remained high; while urbanisation has steadily increased; and the country has only made modest strides in terms of economic equality and governance.[36] The component representing *drivers and enablers* in figure 4 and 5 has therefore not changed significantly between the two elections.

The Nigerian elections of April 2007 were judged by observers to fall short of the standards for credible, free and fair elections and considered to have been worse than the previous elections.[37] An estimated 200 people were reported to

[36] See Appendix B: Calculations for Nigeria and Ethiopia

[37] Omotosho, Mashood (2008) *Electoral Violence and Conflict in Nigeria – The 2007 Elections and the Challenges of Democratisation* (paper presented at the 27th Annual Nigerian Political Science Association Conference); European Union Election Observation Mission (2007) 'Nigeria – Final Report – Gubernatorial and State Houses of Assembly Elections 14 April 2007 and Presidential and National Assembly Elections 21 April 2007', on the Internet: http://eeas.europa.eu/human_rights/election_observation/nigeria/final_report_en.pdf (retrieved 17 June 2013).

have lost their lives, either during the campaign, or in protests after the results were announced.[38]

The elections that followed saw an improvement in electoral procedures compared to 2007, but also substantially more violence. While there was only limited hostility during the campaign, following the announcement of President Jonathan's re-election, the situation deteriorated rapidly with large-scale protests, primarily in the country's northern states. Estimates of the death toll vary from 200 to over 1000, while between 74 000 and 91 000 people were displaced from their homes.[39] Thus, the *protests* component is larger in 2011 than it was in 2007 (see figures 3 and 4 above).

As regards to access to ICTs, Nigeria saw a doubling in mobile phone subscriptions, and a remarkable reduction in Internet cost, between 2007 and 2011.[40] Accordingly, there is an increase in the *ICT* component between the two periods.

According to the calculations, the *influencing the ICT infrastructure* component has grown over time. It has been reported that some ISPs block access when users are found to be downloading copyrighted content. Freedom House states that this is done not to protect intellectual property but to manage network traffic.[41]

It is difficult to assess the *political activism online* component since it measures the potential user base and not a mapping of the online activities. The reason for looking into the potential user base is that, during the course of this study, the authors have not been able to identify data and reports of how ICTs were used to mobilise the post-election protests. Nevertheless, there are some studies that show that political activism online have been present during the selected years, illustrating that Nigerians are willing and able to use ICTs for political activism and for organising protests. For example, Ifukor documented in his report how citizens mobilised online to vote during the 2007 elections.[42] The Occupy Nigeria campaign, a socio-political protest movement that began in response to

[38] European Union Election Observation Mission (2007) *Nigeria – Final Report – Gubernatorial and State Houses of Assembly Elections 14 April 2007 and Presidential and National Assembly Elections 21 April 2007*.

[39] Ibid.

[40] See Appendix B: Calculations for Nigeria and Ethiopia

[41] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013).

[42] Ifukor, Presley (2010) '"Elections" or "Selections"? Blogging and Twittering the Nigerian 2007 General Elections', *Bulletin of Science Technology and Society*, Vol. 30, No. 6, pp. 398-414; Iwilade, Akin (2013) 'Crisis as opportunity: youth, social media and the renegotiation of power in Africa', Journal of Youth Studies, 2013

the fuel subsidy removal in the beginning of 2012, demonstrated that Nigerians have used ICTs for political activism online.[43]

According to reports from Freedom House and Open Net Initiative, there are no significant restrictions on Internet content in Nigeria. The government appears to be more concerned with fighting cyber-crime than with censuring the content.[44] The *influencing the Internet* component is thus low in intensity and unchanged from 2007 to 2011.

For the purposes of this study, the authors have been unable to find satisfactory measurements for the security forces' activities to counteract protests. The *security forces* component has thus remains unchanged between the two elections. In terms of countering protests, the Nigerian military has a rather ambiguous approach. On the one hand, the military has introduced a number of efforts to build understanding across linguistic and religious divides; on the other, it has on occasion reacted with disproportionate force to civilian activism and protests.[45]

[43] Open Society Foundations (2012) *Mapping Digital Media: Nigeria*, on the Internet: http://www.opensocietyfoundations.org/reports/mapping-digital-media-nigeria (retrieved 3 July 2013); see also Iwilade, Akin (2013) 'Crisis as opportunity: youth, social media and the renegotiation of power in Africa'**,** Journal of Youth Studies, 2013

[44] Kelly et al., (2012) 'Freedom on the Net 2012'; Open Net Initative (2013) *Country Profile – Nigeria*, on the Internet: https://opennet.net/research/profiles/ nigeria (retrieved 3 July 2013).

[45] Hill, Jonathan N. C. (2012) *Nigeria Since Independence – Forever Fragile?* (Basingstoke, Palgrave Macmillan).

4 Ethiopia

This chapter presents the initial trial of the model, applied on the 2005 and 2010 elections in Ethiopia. The underlying calculations for Ethiopia can be found in Appendix B. The following presentation in this chapter will discuss the components in the model.

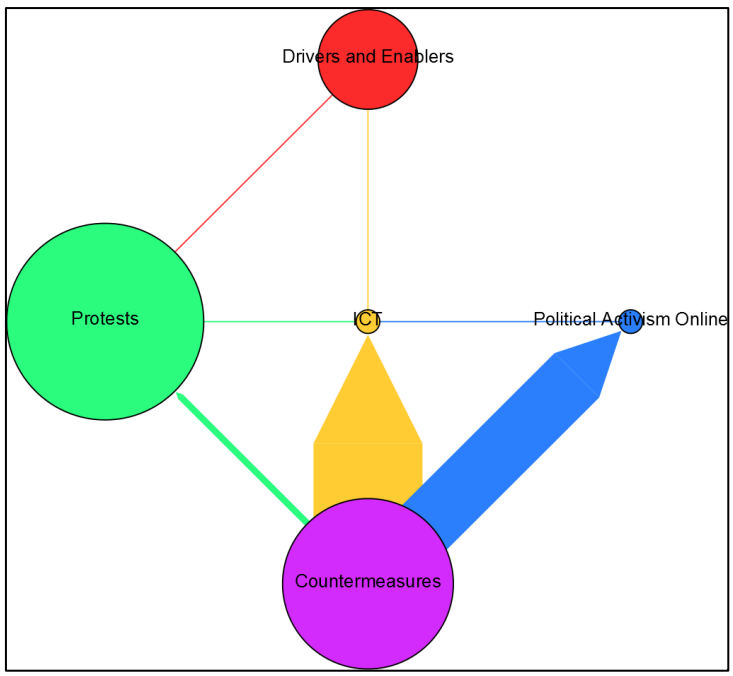

Figure 5 Ethiopia 2005

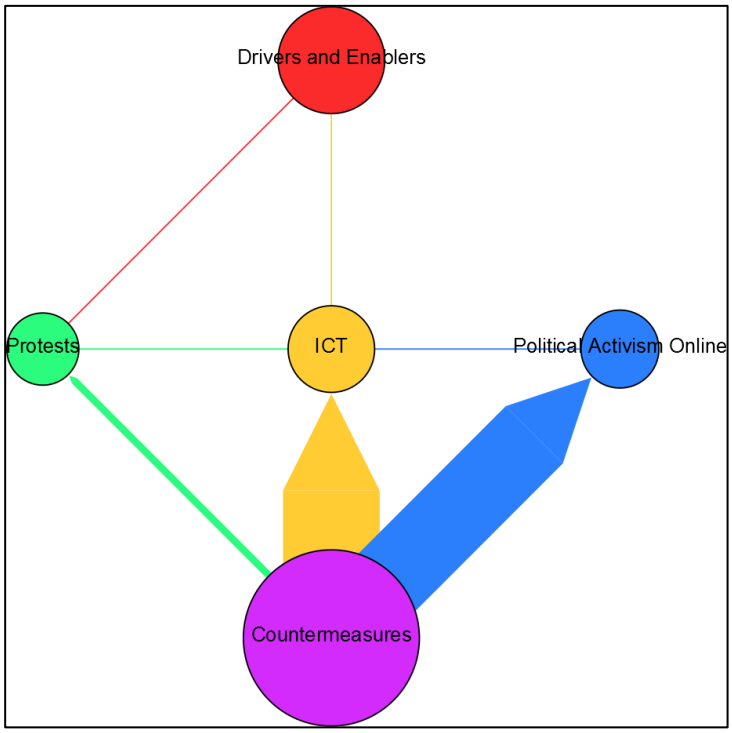

Figure 6 Ethiopia 2010

In 1991, the new party, the Ethiopian Peoples' Revolutionary Democratic Forces (EPRDF), dismantled the structures of the Derg military regime (1974-1991), and enacted a new administrative map of the country, based on linguistic and ethnic criteria.[46]

The 2005 parliamentary elections were the most competitive elections Ethiopia had experienced, with an unprecedented high voter turnout. According to a number of international observers, what began on election-day as an orderly voting process was followed in many areas by flawed counting and tabulation processes. [47] Social unrest erupted across the city, including taxi strikes and

[46] Gudina, Merera, 2012, 'Elections and democratization in Ethiopia, 1991–2010', *Journal of Eastern African Studies*, 5:4, p. 664

[47] Carter Center (2005) 'Observing the 2005 Ethiopia national elections – Final Report'; European Union Election Observation Mission to Ethiopia 2005," Final Report on the Legislative Elections"; European Union Election Observation Mission to Ethiopia (2005) *Final Report on the Legislative Elections*, on the Internet: http://eeas.europa.eu/human_rights/election_observation/ethiopia/final_report_en.pdf (retrieved 19 June 2013)

student demonstrations at the University of Addis Ababa, with opposition supporters demonstrating against the election results.[48] It ended in repeated incidents of serious post-election violence, which included the killing of more than 40 people by the security forces, while others were injured, and many students were arrested.[49]

Compared to the 2005 elections, the European Union's election observers stated that the 2010 vote, which was Ethiopia's second multiparty election, unfolded in a peaceful manner and with a high voter turnout.[50] Accordingly, the *protests* component is minor for the 2010 elections. However, although freedoms of assembly and association are guaranteed by the constitution they are according to Freedom House limited in practice. This is exemplified by the fact that street demonstrations have been banned since 2005.[51]

The *security forces* component has remains unchanged between the two elections since the authors have been unable to find satisfactory measurements for the component. The excessive use of government force during the post-election violence in 2005, and the reports of police regularly broking up political meetings organised by the opposition during the 2010 election campaign[52], suggests that the *security forces* component could have had a significant size.

Ethiopia is the second-most populous country in Africa, but poor infrastructure and a government monopoly in the telecommunications sector have hindered the growth of ICTs. As a result, Ethiopia has one of the lowest rates of Internet and mobile telephone penetration on the continent.[53] In recent years, the Ethiopian government has attempted to increase access through the installation of fibre-

[48] Carter Center (2005) 'Observing the 2005 Ethiopia national elections – Final Report', p. 25

[49] Carter Center (2005) 'Observing the 2005 Ethiopia national elections – Final Report'; see also European Union Election Observation Mission to Ethiopia 2005," Final Report on the Legislative Elections"; European Union Election Observation Mission to Ethiopia (2005) *Final Report on the Legislative Elections*, on the Internet: http://eeas.europa.eu/human_rights/election_observation/ethiopia/final_report_en.pdf (retrieved 19 June 2013).

[50] European Union Election Observation Mission to Ethiopia 2010, 'Ethiopia: Final Report, House of People's Representatives and State Council Elections May 2010', on the Internet: http://www.eueom.eu/files/pressreleases/english/final-report-eueomethiopia-08112010_en.pdf (retrieved 10 June 2013)

[51] Freedom House (2011), 'Freedom in the World – Ethipoia', *Freedom House* 2011, on the Internet: http://www.freedomhouse.org/report/freedom-world/2011/ethiopia (retrieved 10 June 2013).

[52] Freedom House (2011), 'Freedom in the World – Ethipoia', *Freedom House* 2011, on the Internet: http://www.freedomhouse.org/report/freedom-world/2011/ethiopia (retrieved 10 June 2013).

[53] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013).

optic cables, satellite links, and mobile broadband services.[54] In other words, an increase in the *ICT* component can be observed between the two elections.

Despite poor Internet access, the government maintains a stringent system of controls and is, according to Freedom House, the only country in sub-Saharan Africa to implement nation-wide Internet filtering.[55] Prior to the 2010 elections, the government passed a series of new laws restricting the freedom of expression.[56] In addition, the authorities used regime apologists, paid commentators and pro-government websites to actively manipulate the online news and information landscape.[57] Consequently, in Figure 6 above, the *countermeasures* arrow that points toward *political activism online* is wider for the 2010 elections. The arrow that points toward the *ICT* component is actually wider in the 2005 model than in the 2010 model; this is due to the fact that one of the variables chosen to represent ICT countermeasures – *ONIToolsFiltering* (see Appendix B) – was at a minimum in 2010, meaning that no evidence of filtering could be detected. In 2011, however, the same variable was at its maximum, indicating pervasive filtering.

The *political activism online* component has increased between 2005 and 2010 since the potential user base has increased. However, this does not describe the actual political activism online activities. Regime critics and opposition forces in the country's diaspora increasingly use the Internet as a platform for political discussion and criticism of the regime. But given the low Internet penetration rate, the domestic Ethiopian blogosphere is still in its initial stages.[58]

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[54] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013).

[55] Kelly et al. (2012) 'Freedom on the Net 2012 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN%202012%20FINAL.pdf (retrieved 3 July 2013).

[56] The most important of them included the ''Amended Electoral Law Proclamation'' (HPR, No. 532/2007), the ''Political Parties Registration Proclamation'' (HPR, No. 573/2008), the ''Freedom of the Mass Media and Access to Information Proclamation'' (HPR, No. 590/2008), the ''Anti-Terrorism Law'' (HPR, No. 652/2009); the ''Registration and Regulation of Charities and Societies Proclamation'' (CSO Law) (HPR, No. 621/2009), and the ''Electoral Code of Conduct for Political Parties'' (HPR, No. 662/2009), these laws have been mentioned in Gudina's article (2012).

[57] Kelly, Sanja and Cook, Sarah (2011) 'Freedom on the Net 2011 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN2011.pdf (retrieved 5 July 2013).

[58] Kelly, Sanja and Cook, Sarah (2011) 'Freedom on the Net 2011 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN2011.pdf (retrieved 5 July 2013); see also

5 Discussion

The study described in this report is an FOI internal competence-building project; as such, one of its aims is to find ways to further improve the model and to propose recommendations that may apply to the conduct of similar future studies. The following discussion is based on two main aspects of the study; first, the information acquired in the identification of key variables of use in examining ICTs' role and development in sub-Saharan African; and, second, in the application of the ensuing model on Nigeria and Ethiopia. However, in order to fully evaluate the model, more countries would need to be included, and with different characteristics.

As previously stated, the model is descriptive and at this point it is not intended to model causality. In general, the interrelation between ICTs and the mobilisation of large-scale protests is a methodologically difficult area, where it is problematic to establish causal relations. One reason why it is difficult to ascertain the role of ICT is that it typically grows in parallel with other patterns of change: social, political, economic and technological. The model is an attempt to describe this complex environment.

When comparing different components in the model, it is important to understand that all values are relative and do not express absolute measures. For instance; what does it mean if the *protest* component is bigger than the *ICT* component? Not much, since they do not represent the same entities. It is more fruitful to examine how the model changes over time for a given country, and to compare this change with other countries over the same period of time.

In general, the lack of reliable secondary data makes some countries more suitable for study than others. It is also important to note that the variables vary within a country. The difference is particularly apparent for urban and rural areas, and is a variable that should be considered in future studies. For example, Ethiopia's telecommunications infrastructure is almost entirely absent in rural areas, which are home to about 85 per cent of the population.[59]

Hafkin, Nancy J. (2006) '"Whatsupoch" on the Net:The role of information and communication technology in the shaping of transnational Ethiopian identity', *Diaspora*, Vol 15, pp. 221-245

[59] Kelly, Sanja and Cook, Sarah (2011) 'Freedom on the Net 2011 – A Global Assessment of Internet and Digital Media', *Freedom House*, on the Internet: http://www.freedomhouse.org/sites/default/files/FOTN2011.pdf (retrieved 5 July 2013).

ICT component

It has been relatively easy to find data for the variables in the ICT component, with one exception, mobile broadband subscriptions per hundred inhabitants. Many observers state that the future of broadband Internet connection lies with third generation mobile telecommunications (3G). In Nigeria, for example, many customers are cancelling their wired Internet subscriptions in favour of 3G mobile Internet subscriptions.[60]

The statistics speak for themselves. In 2009, Nigeria had zero mobile broadband subscriptions per hundred inhabitants; in 2010 it was still low 0.6%, with a drastic rise up to 10% in 2011.[61] Meanwhile, the numbers of users in Ethiopia have remained low: 0.1% in 2009, 0.14% in 2010 and 0.28% in 2011.[62] Since the International Telecommunication Union (ITU) database, *The World Telecommunication/ICT Indicators*, at time of writing only has statistics for 2009-2011; this variable was not included in the calculations.

During the course of this study, only one academic report that specifically has examined the use of ICTs for mobilising post-election protests for the cases selected here was identified.[63] As a result, it has been difficult to describe the role of ICTs in the mobilisation examined in these particular cases. There are nevertheless a number of studies that examine the influence of media on movements in sub-Saharan Africa, which has been helpful.[64]

Countermeasures

One major difference between Nigeria and Ethiopia is the capability and inclination to influence the ICT infrastructure and online content. According to Freedom House and the Open Net Initiative, Ethiopia remains a highly restrictive environment in which to express political dissent online, while Nigeria is more open and tolerant.

Cyberspace has become an increasingly contested space and an object of geopolitical competition. The Open Net Initiative, which documents Internet content-filtering worldwide, notes that roughly 1 billion Internet users live in

[60] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013).
[61] ITU (2012) 'The World Telecommunication/ICT Indicators database online', ITU, 16th Edition
[62] ITU (2012) 'The World Telecommunication/ICT Indicators database online', ITU, 16th Edition
[63] See Ifukor, Presley (2010) '"Elections" or "Selections"? Blogging and Twittering the Nigerian 2007 General Elections'
[64] See for example Olorunnisola and Martin (2012); Chiluwa (2012); Goldstein and Rotich (2008); Iwilade (2013); Wasserman (2007)

countries (over forty of them) that regularly censor the Internet.[65] In most of sub-Saharan Africa, the technical approach to Internet-filtering has not changed drastically since 1996.[66] Sporadic blocking of sites is the norm, and most filtering targets political content. However, many countries in the region also exercise more indirect forms of censorship, such as arresting, or threatening, bloggers, online journalists and other Internet users.[67]

The Open Net Initiative concludes that the absence of widespread filtering in sub-Saharan Africa does not necessarily indicate that these countries are taking an intentionally open approach to the Internet, so that the direction that Internet regulation will take in the region remains to be seen.[68] With the rapid diffusion of ICT, more research on this topic is needed.

Enablers and drivers

Recent research finds that social movement organisations play a significant role in mobilising and supporting participation in large-scale protests.[69] The strength of civil society varies greatly across Africa. In many countries, civil society is weak and fragmented, and engages only a sliver of the population, mainly in urban areas.[70] This study has not been able to identify a suitable measure for social movement organisations. However, freedom of assembly and association is included in the governance variable (see Appendix A).

Although unemployment should be an important variable, we have chosen to omit it due to insufficient or non-existing data.

[65] Deibert, Roland (2013) *Black Code*: *Inside the Battle for Cyberspace*, (Toronto, Signal)
[66] Heacock , Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, 2009, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 23 May 2013)
[67] Heacock , Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, 2009, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 23 May 2013)
[68] Heacock , Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, 2009, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 23 May 2013)
[69] Fisher, Dana R. and Boekkooi, Marije (2010) 'Mobilizing friends and strangers', *Information,Communication & Society*, 13: 2, pp. 193 — 208; Fisher, D. R., Stanley, K., Berman, D. and G. Neff. 2005. "'How do organizations matter? Mobilization and support for participants at five global protests,' *Social Problems* 52(1), pp. 102-121.; Howard, Philip and Hussain, Muzammil (2013) *Democracy's fourth wave? : digital media and the Arab Spring* (New York, Oxford University Press)
[70] Africa Center for Strategic Studies (2011) 'Africa and the Arab Spring – A New Era of Democratic Expectations', Africa Center for Strategic Studies, ACSS Special Report

Protests

This study used a simple arbitrary rating for measuring the *protests* component, which measures the consequences of protests. A preferred variable would have been the volume of protesters. In general, it is difficult to isolate instances of political mobilisation from general social unrest. Nevertheless, the variable gave an indication of the intensity of protests, providing comparisons over time.

Security forces

In recognition of the importance of the role of security forces in influencing the outcome of a large-scale mobilisation, this study has not been able to identify a suitable approach in measuring the component.

Political activism online

There are different ways of examining online political activities, such as performing interviews and mapping the blogosphere and tweets, but due to time constraints and access to data, this was not possible. In this study, the *political activism online* component is an indicator of the *potential* for online activism (more on this in Appendix A); it does not say anything about *actual* political content, or use.

For instance, the *political activism online* arena in Ethiopia has increased between the years of 2005 and 2010, even though the expectation was that, due to the legal framework that was introduced during that period, it should have remained relatively small.

Sex-disaggregated data

The study wished to use sex-disaggregated data for the variables. However, during the course of this study found insufficient data. As part of creating an understanding of the role ICTs during large-scale mobilisation, sex-disaggregated data should be included in future studies.

User profiles

In order to better understand how ICTs are used during mobilising large-scale protests, there is a need to better understand how people use ICT tools in general. The cultural significance of the Internet and the socio-economic status of its users vary considerably from place to place, according to the diverse experiences, needs and aspirations of individuals. In Western societies, cyberspace is often viewed as an “alter” space of information, research and

leisure that functions in a parallel, or complementary, fashion to existing public spaces and institutions. In the sub-Saharan countries, the costs of using ICTs are much higher, and – for some countries – the use of ICTs will depend on whether or not the technology will be usable and relevant to address real needs.

Triggers for mobilising

A trigger is an event that sparks the mobilisation. Citizens may be driven to engage in mobilising a protest out of a sense of moral indignation incited by an emotional response to an aggrieving situation. Reactive emotions such as anger, moral outrage, or confusion in the face of injustice, can trigger the decision to participate in protest events.[71] Strong reactive emotions may even make these people inclined to participate in protests that do not otherwise have pre-existing affective ties to a protest movement, or personal links to other protesters.[72]

The characteristics of the trigger could be influential for choosing between mobilising protests through traditional means, or political activism online, or combinations thereof. This is a topic that could be further explored in future studies.

[71] Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest: Evidence from the Tunisian Revolution', Discussion Paper, *Deutsches Institut für Entwicklungspolitik*, ISSN 1860-0441, on the Internet: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179030, (retrieved 10 June 2013)

[72] Jasper, J. M. and J. D. Poulsen (1995) 'Recruiting strangers and friends : moral shocks and social networks in animal rights and anti-nuclear protests', *Social Problems* 42 (4), pp. 493–512

6 Conclusions

There are undeniably multiple challenges in the use of ICTs to achieve mobilisation for large-scale protests in sub-Saharan Africa; these include poor Internet infrastructure, high connection and connectivity costs, inadequate ICT knowledge and a rapid diffusion of digital media. There are, however, great differences among the countries in the region, as well, both regarding infrastructural conditions and governmental control over information technologies. These differences are notable when comparing Ethiopia and Nigeria.

One key observation regards the need to include both old media, foremost radio, and new when examining the role of ICTs in sub-Saharan Africa. It is important to understand that the target audience's information environment is dictated by its socio-political and socio-economic conditions, such as literacy and purchasing power. Currently, digital media does not replace radio, but supplements it. Even so, it is important not to overstate the significance of ICTs; acquiring momentum while mobilising protests requires interpersonal ties and word of mouth exchanges regardless of which medium is used for communication.

The study constitutes a first step in describing the complex interactions between ICTs and other components during large-scale mobilisation in a sub-Saharan context. A preliminary version of the model has been trial tested on the cases of Nigeria and Ethiopia, two large and populous countries. In order to further develop and evaluate the model, more countries with different characteristics should be included.

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Appendix A: Variables

A number of variables may increase, or decrease, the size of different components in the model developed in this study. Additionally, Sub-Saharan Africa differs from other regions that have more developed ICTs infrastructure. Therefore, the variables used to determine the sizes of the components in the model, which are described in this appendix, have been selected with their applicability in the Sub-Saharan context first in mind.

1 Enablers and Drivers

The roots of large-scale mobilisations are complex. Indeed, as noted above, people have always found reasons and means for protests and rebellion. Social science offers a wide range of theories to explain why, how and when mobilisation occurs.[73] This study does not seek to test the comparative explanatory power of those different schools of thought, though, but instead draws on a set of mutually reinforcing concepts, chosen from a wide set of theories, in constructing its model.

Mobilisation requires a ready supply of protestors, a source of grievance that creates a demand for activism and a catalyst that sets the mobilisation in motion. In the model, these three elements are called enablers, drivers and triggers respectively. Depending on the local context, various types of enablers, drivers and triggers may lay at the root of popular mobilisation. Circumstances and events that together provoke outrage in one country may pass unnoticed in another. Indeed, it is from the combination of enablers, drivers and triggers that mobilisation is born.

The following two subsections provide detailed definitions of enablers and drivers. These two, which are represented as one component in the model, are also related to relevant variables and data sources.

1.1 Enablers

The political, economic and demographic structure of a society can be more or less permitting of large-scale mobilisation and political activism, whether in the streets or online. Enablers are contextual factors that provide for a sufficient supply of activists and protestors, and that permit those individuals to interact.

Drawing on the rational choice approach to collective action, enablers can be understood as factors that reduce the transaction cost of mobilisation.[74] Such costs may be either threats of punishment, for example in the form of loss of employment or position in society, or factors that impose difficulties on the ability of people to interact and communicate, such as the absence of a common language. In essence, all other things being equal, a group of unemployed people

[73] For a brief overview of the most common theories see Breuer, Anita (2012) 'The Role of Social Media in Mobilizing Political Protest – Evidence from the Tunisian Revolution', *Discussion Paper* (Bonn, German Development Institute), pp. 4-8.

[74] For a classical account of the rational choice approach to revolution see Tullock, Gordon (1971) The Paradox of Revolution, *Public Choice*, vol. 11, no. 1, pages 89-99.

who speak the same language are more easily mobilised than a linguistically fragmented group of full-time workers, because the transaction costs of the individuals in the former group are lower.

From studies of mobilisation, a number of factors that may serve as enablers can be identified: high unemployment rates; a relatively young population; high rates of urbanisation; having a common language; the presence of established networks; and infrastructure.[75] These examples are discussed in greater detail below, by drawing on examples from sub-Saharan Africa. Examples of how enablers may influence the form of mobilisation are also provided.

1.1.1 Unemployment

As Saidani, Breuer and others demonstrate, the first organisers and participants of the Tunisian Revolution were unemployed, or underemployed, individuals with limited prospects for securing formal and gainful employment.[76] In order to participate in a protest, or engage in political activism, an employed individual may have to forfeit part of his or her salary and risk being fired; for an unemployed person, such costs are absent. On the other hand, as will be discussed in the section on ICT below, unemployed individuals may lack the purchasing power necessary for accessing ICT. As such, unemployment is thus an enabler for street protests, but not necessarily for political activism online.

Collecting data on unemployment in developing countries is notoriously difficult, primarily because the informal sector is large, and because it is not obvious how to distinguish between farm labour, household work and underemployment. In addition, household survey and population census data are collected infrequently, and the methodologies vary across countries.[77] Due to the insufficiency or non-existence of data, this factor has not been included in the two selected case studies.

[75] See for example MacCulloch, Robert (2003) The taste for Revolt, *Economic Letters*, vol. 79, no. 1, pages 7-13.

[76] Saidani, Mounir (2012) 'Revolution and Counterrevolution in Tunisia – The Forty Days That Shook the Country', *Boundary 2*, Vol. 39, No. 1, pp. 44-54; and Breuer (2012) 'The Role of Social Media in Mobilizing Political Protest', p. 18.

[77] For a discussion of these issues see Bardasi, Elena; Beegle, Kathleen; Dillon, Andrew and Serneels, Pieter (2011) 'Do Labor Statistics Depend on How and to Whom the Questions Are Asked? Results from a Survey Experiment in Tanzania', *World Bank Economic Review*, Vol. 25, No. 3, pp. 418-447.

1.1.2 Youth

Studies of mobilisation have consistently found that youth are more likely than other age groups to participate in revolts and political activism.[78] Urdal, drawing on Goldstone, argues that demographic "youth bulges" have historically been associated with political upheaval, and that this pattern remains highly significant in a cross-country analysis covering the years 1950-2000.[79]

It is comparatively easy to compile statistics on the age composition of a population, and even for countries that rely on infrequent censuses; relatively good estimates can be produced. Both the World Bank and the United States Census Bureau provide detailed population data on essentially all countries in the world.

In terms of age, Africa stands out from other continents. Indeed, the Africa Center for Strategic Studies argues that, "with 70 per cent of the total population under 30 years of age, Africa is the world's youngest continent. This creates a vitality and dynamism conducive to change"[80].

1.1.3 Urbanisation

Capital cities, or other large urban centres, often serve as the epicentres of protests and activism. For example, Commins draws a direct link between population density and political mobilisation, and points out that, "Africa's cities have become densely concentrated centres of unemployed young men. This is a combustible mix […]".[81] Studies of Sub-Saharan Africa have furthermore shown that urban dwellers tend to have better access to ICT than those living in rural areas.[82] Siegle et. al., summarise:

> Congregated populations have historically been relatively easier to inform and organize. This has facilitated political party formation

[78] See for example MacCulloch (2003) 'The taste for Revolt'.
[79] Urdal, Henrik (2006) 'A Clash of Generations – Youth Bulges and Political Violence', *International Studies Quaterly*, Vol. 50, No. 3, pp 607-629; Goldstone, Jack A. (1993) *Revolution and Rebellion in the Early Modern World* (Berkley, University of California Press).
[80] Siegel et al. (2011) 'Africa and the Arab Spring – A New Era of Democratic Expectations', Africa Center for Strategic Studies, ACSS Special Report, pp. 21-22.
[81] Commins, Stephen (2011) 'Urban Fragility and Security in Africa', *Africa Security Brief* (Washington DC, Africa Center for Strategic Studies).
[82] Buys, Piet; Dasgupta, Susmita; Thomas, Timothy S. and Wheeler, David (2009) 'Determinants of a Digital Divide in Sub-Saharan Africa – A Spatial Econometric Analysis of Cell Phone Coverage', *World Development*, Vol. 37, No. 9, pp. 1494–1505.

> and popular engagement with government. Urbanized populations can also be more readily mobilized for social or political protests.[83]

As such, urbanisation is thus an enabler for mobilisation, but it is not clear whether it is more closely associated with street protests or activism online. On the one hand, ICT, and thus online forums, are more readily available in cities, but on the other, so are the open squares and public institutions that may serve as focal points for protests.

The World Bank provides comprehensive data on urbanisation. Currently, 36 per cent of the population in Sub-Saharan Africa live in cities, but this number is set to increase steadily, reaching 60 per cent by 2050. The difference among countries is however great, ranging from 86 per cent in Gabon to 11 per cent in Burundi.[84]

1.1.4 Common languages

Howard and Hussain illustrate that having a common language helped the Arab revolts spread from Tunisia to Egypt and beyond. It also helped diasporas and other foreign groups to participate in and aid the mobilisation.[85] Indeed, the same argument can be made regarding single countries. All other things being equal, having a common language within a country makes large-scale mobilisation comparatively easier by facilitating communication. A common language is also a prerequisite for using most forms of ICT. As such, a common language is thus enables mobilisation, particularly political activism online.

The academic literature is rife with indexes of ethnic, religious and linguistic fractionalisation. Since such variables change relatively little over time, using relatively old data is generally not a problem. This study uses the linguistic fractionalisation index computed by Desmet, Ortuño-Ortín and Wacziarg, which measures the probability that two individuals, chosen at random, speak different languages.[86] This index does not take into account the fact that one individual may speak several languages – a very common occurrence in Sub-Saharan Africa

[83] Siegle et.al. (2011) 'Africa and the Arab Spring', p. 21.
[84] Own calculations based on World Bank data; and UN-HABITAT (2010) *The State of African Cities 2010 – Governance, Inequality and Urban Land Markets* (Nairobi, UN-HABITAT).
[85] Howard and Hussain (2012) 'Democracy's Fourth Wave?', pp. 47-67.
[86] Desmet, Klaus; Ortuño-Ortín, Ignacio and Wacziarg, Romain (2012) 'The Political Economy of Linguistic Cleavages', *Journal of Development Economics*, Vol. 97, No. 2, pp. 322-338; this study uses the variable labelled *LingFract*.

– but focuses solely on a person's first language. Unfortunately, the authors are unaware of any index that accounts for multilingualism.

Even more than for the previous variables, the variation across sub-Saharan countries is substantial. For Rwanda and Burundi, the figure is well below one per cent, whereas for the Central African Republic, Chad and Tanzania, it reaches above 95 per cent.[87]

1.2 Drivers

As Muller and Jukam observe, "[p]eople who take part in acts of civil disobedience or political violence are discontent about something. That is a truism."[88] Drivers, simply put, create the discontentment that makes people want to go out and protest. As Atkinson notes about South Africa:

> Generally, a public protest is the result of a culmination of numerous frustrations, often building up over a long period of time. Every town is likely to have its own particular combination of factors leading to public protest.[89]

Conceptually, if the enablers produce a supply of protestors, the drivers create a demand for protests. Previous studies have identified a number of drivers of mobilisation. This study focuses on two of those: inequality and governance. In the subsections below, these two drivers are related to variables drawn from the Sub-Saharan context, and examples are provided of how different drivers may influence the form of mobilisation.

1.2.1 Economic Inequality

Traditional theories of grievance and political action emphasise that, "unfulfilled material expectations cause anger, frustration and resentment which manifest themselves in an individual propensity to protest."[90] In his classical study, Gurr

[87] Ibid., data appendix.
[88] Muller, Edward N. and Jukam, Thomas O. (1983) 'Discontent and Aggressive Political Participation', *British Journal of Political Science*, Vol. 13, No. 2, pp. 159-179.
[89] Atkinson, Doreen (2007) 'Taking to the Streets – Has Developmental Local Government Failed in South Africa?' in Bahlungu, Sakhela; Daniel, John; Southall, Roger; Lutchman, Jessica (eds.), State of the Nation – South Africa 2007 (Cape Town, HSRC Press), p. 58.
[90] Breuer (2012) 'The Role of Social Media in Mobilizing Political Protest', p. 4.

argues that persons who rebel are motivated by discrepancies between what they feel they are entitled to, and what they believe they can attain.[91]

While the Gini Coefficient is probably the best known measure of economic disparity within a country, this study takes a broader approach to inequality.[92] This is particularly so, because, in today's globalised world, individuals are likely to compare themselves not only to their countrymen, but also to the citizens of other countries, and perhaps also to a perceived global standard. This study therefore measures inequality by means of a ranking of the Sub-Saharan countries by the Human Development Index (HDI), which is compiled by the United Nations Development Programme (UNDP), and takes into account economic, health and educational variables.

1.2.2 Governance

More recent studies of mobilisation have also pointed to emotional motifs, including in particular beliefs about how society should be governed.[93] Jasper summarises the argument by stating that emotions, such as moral shock, pride and shame, can serve both as causes for mobilisation and as means to reinforce the motivations for protests that are underway.[94] As such, emotions related to governance as a driver mirror economic inequality; instead of unfulfilled material expectations, disappointed beliefs about society provide the motivation for mobilisation.

The Freedom House Index (FHI) provides a well-established quantitative measurement of governance and is available for most countries, going back to 1972. The FHI has two components, political rights and civil liberties, which are graded from one to seven, with one being the best grade. This study measures governance by ranking the countries in Sub-Saharan Africa according to the sum of these two components.

[91] Gurr, Ted R. (1970) *Why Men Rebel* (Princeton, Princeton University Press) pp. 24-30.
[92] For a short description of the Gini Coefficient see, Gini, Corrado (1921) 'Measurement of Inequality of Incomes', *The Economic Journal*, Vol. 31, No. 121, pp. 124-126.
[93] Breuer (2012) 'The Role of Social Media in Mobilizing Political Protest', p. 4.
[94] Jasper, James M. (2011) 'Emotions and Social Movements – Twenty Years of Theory and Research', *Annual Review of Sociology*, Vol. 37, pp. 285-303.

2 Protests

Information regarding the number of people who participate in protests is generally not available in sub-Saharan Africa. Therefore, this study uses the consequences of protests, measured by the number of lives lost and population displaced, as a proxy for their size. This approximation is far from perfect, in particular because it overestimates the size of violent protests over peaceful demonstrations, and because it does not distinguish between violent acts committed by different groups of protestors, or by security forces. Nevertheless, it does capture some aspects of enormous relevance to the people affected, and that may have a determining impact on the final outcome of a protest. In addition, for election-related violence, information on casualties and displacements is generally recorded by international election observation missions.

In order to evaluate the size of a protest, the grading system presented in Table 1 has been used. It grades the intensity of protests on a scale from zero to four, based on the number of lives lost, and the population displaced. In cases where the number of disappearances or arrests has been recorded, they are counted together as displacements, since both types similarly involve an involuntary absence from one's home. If a protest reaches a different level in the two categories, it is given the higher of the two grades.

Lives lost	Population displaced	Intensity
0	0-9	0
1-9	10-99	1
10-99	100-999	2
100-999	1000-9999	3
1000-	10000-	4

Table 1: The protests variable

3 ICT

The ICT component represents which information and communication technologies are available, and how accessible they are, to the population. It is a pre-requisite for the *political activism online* component, which cannot exist without it.

3.1 International Internet bandwidth (bit/s) per Internet user

The total available international Internet bandwidth, divided by the number of Internet users, provides a measure of how easy, or hard (and at what speed), it is to access international content for the average user. This is particularly important when it comes to uploading or accessing information that requires an actual broadband connection, such as YouTube. According to the ITU, there are massive disparities between different regions of the world. While the average Internet user in Europe can access approximately 90 000 bit/s, the average user in sub-Saharan Africa must be content with 2000 bit/s.[95] (For comparison, a baseline streaming YouTube video uses 500 000 bit/s[96]). This limits the possibilities for international involvement in an on-going protest.

3.2 Percentage of households with radio

In many sub-Saharan countries, radio is a more wide-spread technology than mobile phones, and is considered to be the most influential mass media. In countries with a low literacy rate, radio is more effective as a medium for propaganda, or information campaigns, than newspapers or the more modern ICT alternatives which require literacy, most often in a major language.[97] The popular concept of community radio allows listeners to actively interact with the radio

[95] ITU (2011) ‘ The World in 2011: ICT facts and figures’, *ITU* 2011, on the Internet: http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2011.pdf (retrieved 8 July 2013)

[96] Wikipedia (2013) ‘Yutube’, *Wikidepia* 7 July 2013, on the Internet: http://en.wikipedia.org/wiki/YouTube (retrieved 8 July 2013)

[97] Myers, Mary (2009) ‘Radio and Development in Africa’, Concept paper prepared for *the International Development Research Centre of Canada*, March 2009, p.12.

station by phoning in and sharing information that is relevant to listeners that are part of the same shared context—the community.[98] This interactive feature of community radio (which in many respects resembles the role of Internet forums), makes radio an important aspect of the ICT component in sub-Saharan Africa. In a mobilisation context, radio becomes important both as a source of broadcast news and as a channel for agitation.

3.3 Percentage of individuals using the Internet

In the sub-Saharan context, most Internet subscriptions are shared by many individuals. Schools, workplaces and Internet cafés allow ordinary people access to the Internet.[99] While this measure gives no information about access frequency (or what types of activity the user invests her Internet access time in), it is an important statistic that provides the upper limit on the potential audience size for Internet publications, social media and online social networks.

3.4 Internet subscription cost

An essential factor when considering Internet access is the subscription cost and, more importantly, the cost in relation to the means available. In this study, this factor is represented by dividing the price for fixed Internet access, by the gross national income per capita. While many access the Internet through shared connections, for instance by using an Internet café, the Internet penetration rates seen in for instance Europe will not become possible in the region unless Internet subscriptions become cheap enough for individual use, or perhaps shared within a family or other group.[100] When considering Africa, using fixed Internet access as a measure gives an incomplete picture of connectivity; wireless Internet access via 3G Global System for Mobile Communications (GSM) will in the near future

[98] Madamombe, Itai (2005) 'Community radio: a voice for the poor: Better local communication can boost development, democracy', *Africa Renewal* July 2005, on the Internet: http://www.un.org/africarenewal/magazine/july-2005/community-radio-voice-poor#sthash.25gbPi9r.dpuf (retrieved 8 July 2013)

[99] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013).

[100] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013).

become the most common way of connecting to the Internet in most countries in Africa.[101] However, since the adoption of wireless Internet connection systems is a recent phenomenon (in Africa), there is almost no historical data for analysis.

3.5 Mobile Phone Subscriptions

Between 2001 and 2011, the average mobile phone penetration in sub-Saharan Africa rose from 4% to 61%. The penetration rate in the region varies enormously, however; in 2011, the country with the lowest penetration was Eritrea, with 4%, and the highest the Seychelles, with a penetration of 146%.[102] The factor contribution to the *ICT* component is to represent how large a part of the population is able to communicate and coordinate using mobile phones, a much-publicised feature of the protests during the Arab revolts There are also several additional characteristics of mobile telephony that make it so important for ICT development in Africa, including:

- mobile phones are user-friendly and their use requires no particular level of sophistication[103]
- mobile telephony requires much less infrastructure than information transmitted via a wired network[104]
- in the years to come, Internet access will be primarily through 3G GSM (and future technology upgrades)[105]

[101] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/ Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013)
[102] ITU (2012) 'The World Telecommunication/ICT Indicators database online', ITU, 16th Edition
[103] Alozie, Akpan-Obong, Foster (2011)'Sizing up information and communication technologies as agents of political development in sub-Saharan Africa', *Telecommunications Policy*,Vol. 35, pp.752–763
[104] Alozie, Akpan-Obong, Foster (2011)'Sizing up information and communication technologies as agents of political development in sub-Saharan Africa', *Telecommunications Policy*,Vol. 35, pp.752–763
[105] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/ Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013)

4 Countermeasures

In the visual representation of the model, the size of the *countermeasures* component will represent the sum of the variables identified in *security forces*, *influencing the ICT infrastructure* and *influencing the ICT content*.

4.1 Security forces

Security forces can respond in quite different ways to large-scale mobilisation, ranging from openness to, and even support for, protest movements, and from internal fracturing, to firm support for the regime in power. Following the Arab revolts, a number of studies examined the role of the armed forces in popular uprisings.[106] However, the present study has not been able to identify a suitable approach, nor data with which to examine the security forces' countermeasure activities. A potential study method could be Lutterbeck's, where factors such as the type of civil–military relations, the institutionalization of the armed forces, the relationship to society-at-large and the openness to pro-reform movements are examined.[107] The latter is a qualitative approach and, due to time constraints, not possible for application in this study. The result for the depiction in the model is that the *countermeasures* arrow that points towards the *street protest* arena will not change in size.

4.2 Influencing the ICT infrastructure

Although many sub-Saharan constitutions guarantee freedom of expression and of the press, numerous governments use laws against defamation and other laws protecting national security to curtail these freedoms.[108] In the last decade, there has been a push for greater ICT regulation in sub-Saharan Africa, where many countries are enacting new legislation to address ICT ownership, provision and

[106] See for example Lutterbeck (2012), Erickson Nepstad (2011 and 2013), Chenoweth and Stephan, 2011)
[107] Lutterbeck, Derek (2013) 'Arab Uprisings, Armed Forces, and Civil-Military Relations', *Armed Forces & Society*, 39(1) pp. 28-52
[108] Heacock, Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 5 July 2013).

use.[109] The Open Net Initiative measures the degree of governmental filtering for some themes of internet accessible content, as well as for tools for accessing the internet. In this study, the filtering of internet tools is used as an indicator for the capability and intent of a state to influence the ICT infrastructure.

Another way of having an impact on the information flow is to have control over the ICT supply chain, i.e., in some closed markets, all players may be subsumed under a single operator. In such cases, the operator controls the service from end to end, within the supply chain.[110] The status of the operators could have an impact on the willingness of the citizens to express their discontent, if they fear that the regime can control their freedom in using digital media.

In the model, the scoring of the *countermeasures* arrow that is directed towards the *ICT component* will combine the filtering of internet tools and the status of the mobile and Internet operators in a country. If the combined mobile and Internet market is deregulated and has several actors, and if filtering is not apparent, then the country score will be low and the arrow, minor.

4.3 Influencing the Internet content

To counter the growing influence of independent voices online, an increasing number of states are turning to proactive manipulation of web content, rendering it more challenging for regular users to distinguish between credible information and government propaganda. Sub-Saharan Africa has a history of media abuses and restrictions on freedom of the press, so that the region would seem a likely setting for influencing the Internet content, across many levels of sophistication.

To examine the *countermeasures* arrows that point towards *political activism online* comparatively, we have created values based on the Open Net Initiatives' scores for the observed level of filtering of their themes, namely, the political, social and security themes. In addition, we have included the score from the Reporters Sans Frontières (RSF) "Press Freedom Index" for the given year.[111] The Press Freedom Index is an annual ranking of countries based upon the organisation's assessment of the records of a country's press freedom during the

[109] Heacock, Rebekah (2009) 'Sub-Saharan Africa', *Open Net Initiative*, on the Internet: https://opennet.net/research/regions/ssafrica (retrieved 5 July 2013)

[110] ITU (2013), 'Study on international Internet connectivity in sub-Saharan Africa, 2013', on the Internet: http://www.itu.int/en/ITU-D/Regulatory-Market/ Documents/IIC_Africa_Final-en.pdf (retrieved 21 May 2013).

[111] Reporters Without Boarders (2013) 'Press Freedom Index', *Reporters Without Boarders* 2013, on the Internet: http://en.rsf.org/press-freedom-index-2013,1054.html (retrieved 19 June 2013)

previous year. Combining these factors provides an indication of how prone regimes are to influencing Internet content.

5 Political activism online

Research on political activism compares the ways that citizens contribute to the activism, the processes that lead them to do so, and the consequences of those acts.[112] There are different ways of examining online political activity. It can be done through interviews that enquire about Internet users' online and offline protest activities, prior to and during an uprising; this may be in addition to, or solely, conducting surveys in order to learn about the patterns of Internet use and the political behaviour of individuals.[113] Another method is to map the blogosphere, and tweets, by coding them.[114] Due to limited time and resources for the present study, the application of the above-mentioned methods has not been possible. It has also been difficult to retrieve information from the period that the selected cases have been chosen from.

To partake of Internet-mediated content in a meaningful way, literacy is an absolute pre-requisite. In addition, literacy in a major Internet language, foremost English, increases access to content dramatically. Hence, literacy rates (a pre-requisite) as well as measures of secondary and tertiary school enrolments (a higher probability of literacy in a major Internet language) are included as contributing factors to the *political activism online* (PAO) component. The PAO component can never be bigger than the ICT component, since the PAO component cannot exist without it. At this time, the PAO component describes a measure of the largest potential user base possible in the country for a given time, but nothing of what kind of political activism (or of how much), actually happens online.

[112] Norris, Pippa (2003) *Democratic Phoenix: Reinventing Political Activism*, (Cambridge, Cambrigde University press)
[113] See for example Breuer (2012)
[114] Kelly, John and Etling, Bruce (2008) 'Mapping Iran's Online Public: Politics and Culture in the Persian Blogosphere', *Berkman Center Research Publication* No. 2008-01

6 Implementing the model

6.1 Visualisation

The model is meant to show relative differences between countries, but also between two different points in time for a single country. In order to communicate these differences effectively, a simple visualisation was designed where the relative size of the model components represents their potential influence on the model dynamic.

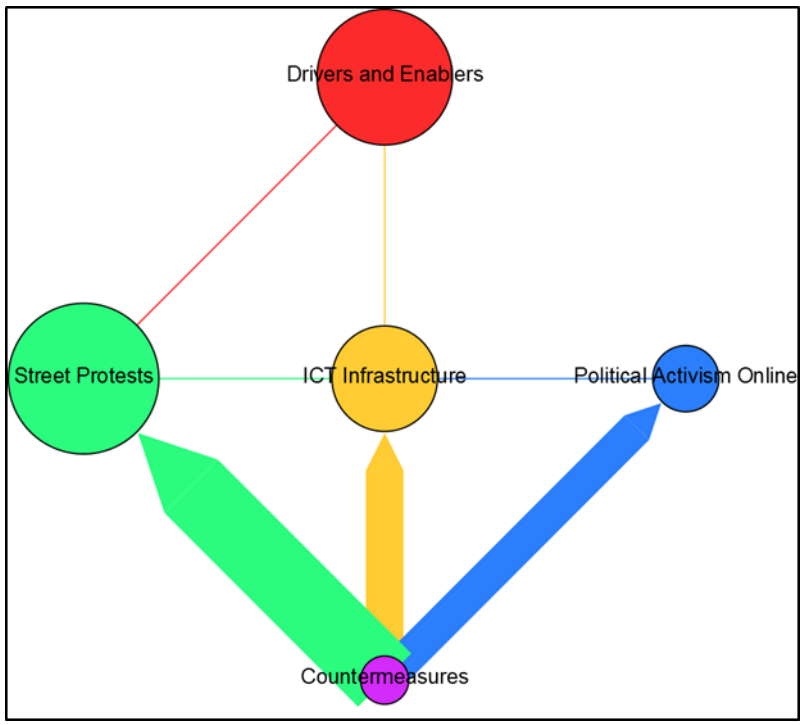


Figure 7: An example of a model configuration

6.1.1 Links and arrows

The links between the upper four components are bi-directional, and the graphical representation of them is merely to indicate connection. The widths of the arrows emanating from the c*ountermeasures* component, however, are indicative of the government's potential to counter the protests by affecting one of the components. The size of the *countermeasures* component represents the sum of potential countermeasures.

6.2 Modelling the components

Each component of the model represents an aggregation of contributing factors. These can be statistical measures such as mobile-cellular telephone subscriptions per 100 inhabitants, or qualitative ratings such as the human development index.

If the contributing factor is a percentage, or a rating, it is simply normalised to range from 0 to 1.

If the contributing factor is an index or a rank, it will be normalised with respect to the domain of comparison, which in this context consists of the other sub-Saharan countries.

Initially, the general approach for modelling the components was to use weighted averaging, described in this formula:

$$C_m = \frac{\left(w_1 M_1 + w_2 M_2 + \ldots + w_n M_n\right)}{n}$$

Where

C_m is one of the model components

w_n is the *n*th weight associated with a contributing factor

M_n is the *n*th contributing factor

With this approach, the contribution of each factor is given a weight ranging from 0 to 1, with 1 being the default. This makes it possible to vary the contribution to the component according to the factor's relevance, and to experiment with different sets of weights. Due to temporal limitations, weights were not determined in this study – this would require more research on other

sub-Saharan countries. Thus, the weights in this study are all 1, thereby simplifying the calculations to:

$$C_m = \frac{\left(M_1 + M_2 + ... + M_n\right)}{n}$$

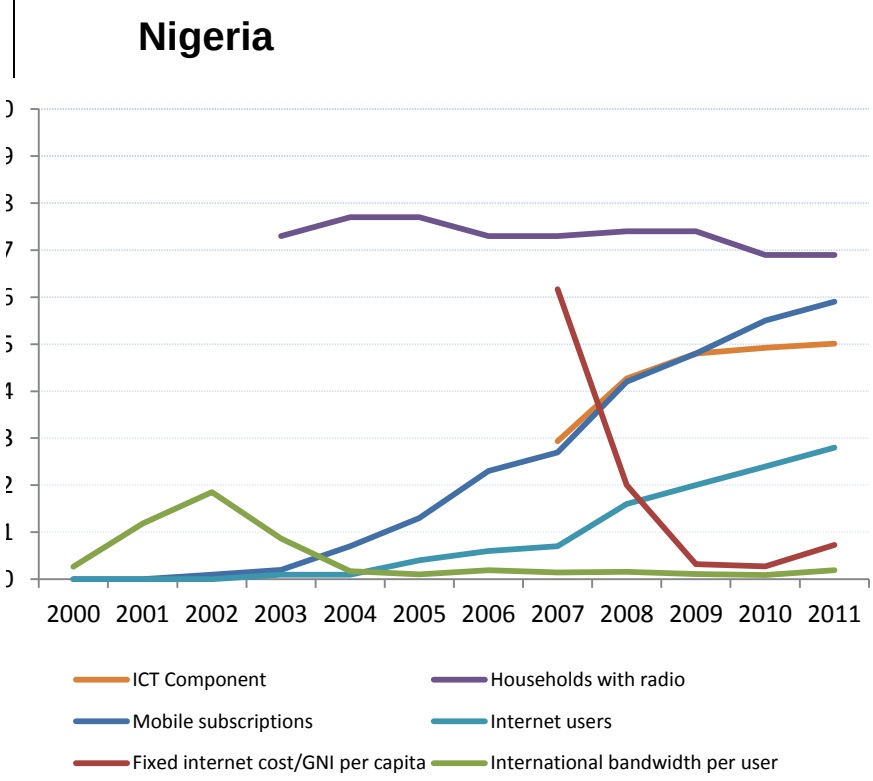
This approach was used for all model components but *Political Activism Online*. Since the ICT component is a necessary pre-requisite for online activities, the PAO component value is determined by ICT accessibility, which is modelled thus:

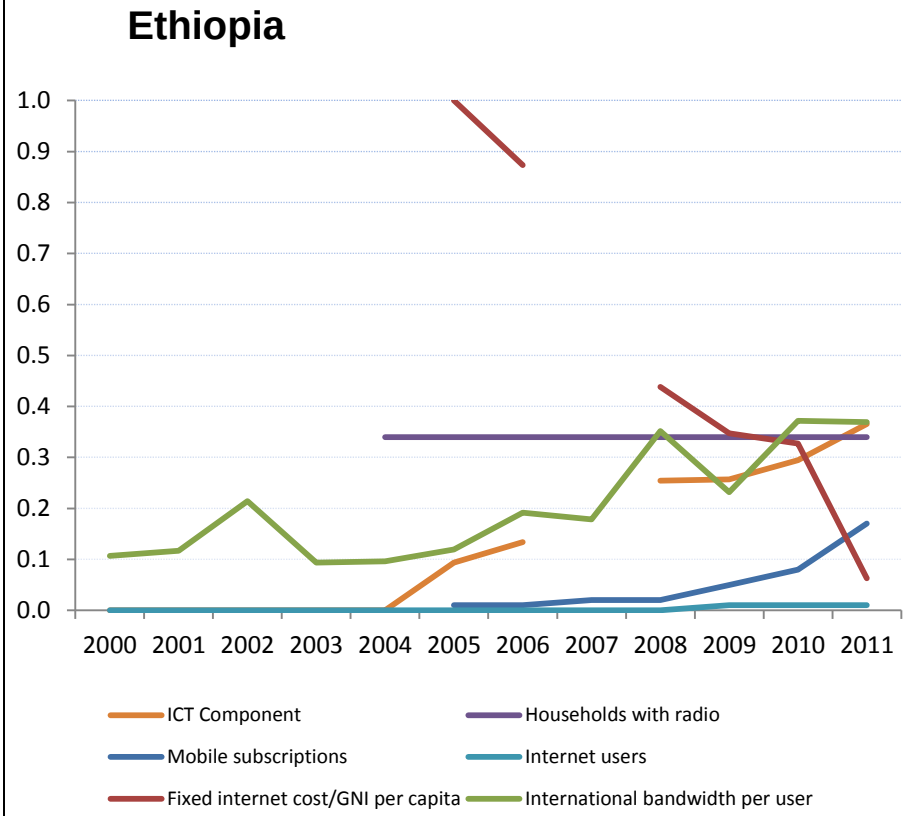
$$PAO = \min(ICT, \frac{\left(M_1 + M_2 + ... + M_n\right)}{n})$$

This way, the PAO component value can never be higher than the ICT component value.

Appendix B: Calculations for Nigeria and Ethiopia

ICT Component





$$ICT = \frac{(IntUsers + MobSub + HouseRadio + (1 - IntCost) + IntBandCap)}{5}$$

Where:

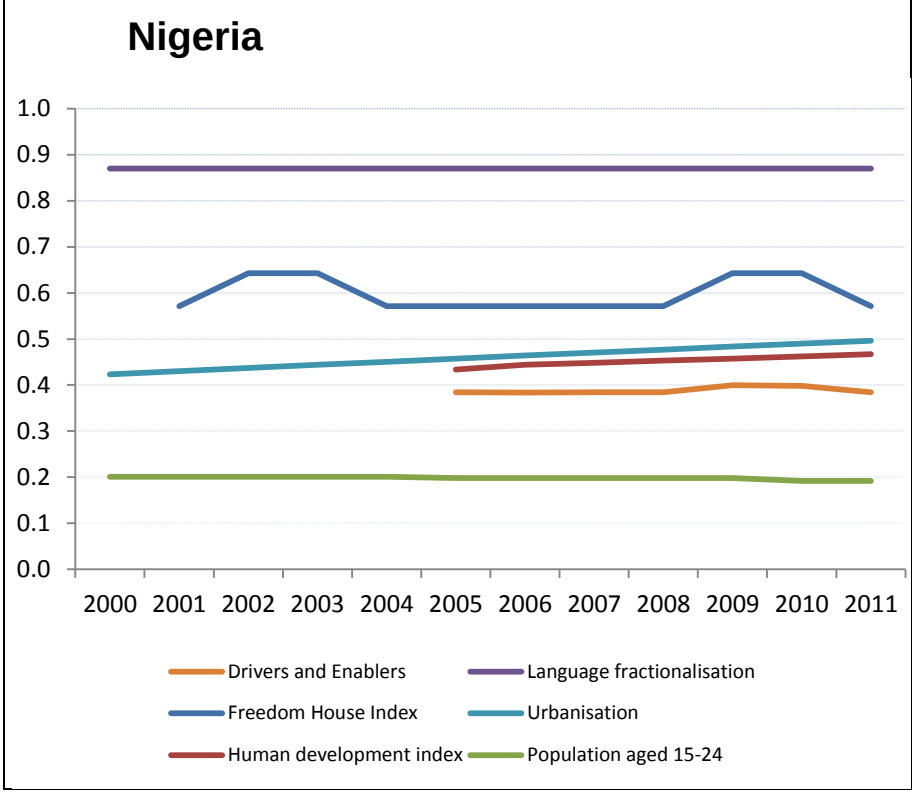
$$IntCost = \frac{Fixed\ internet\ subscription\ cost/(GNI/Capita)}{NormVal_{IntCost}}$$

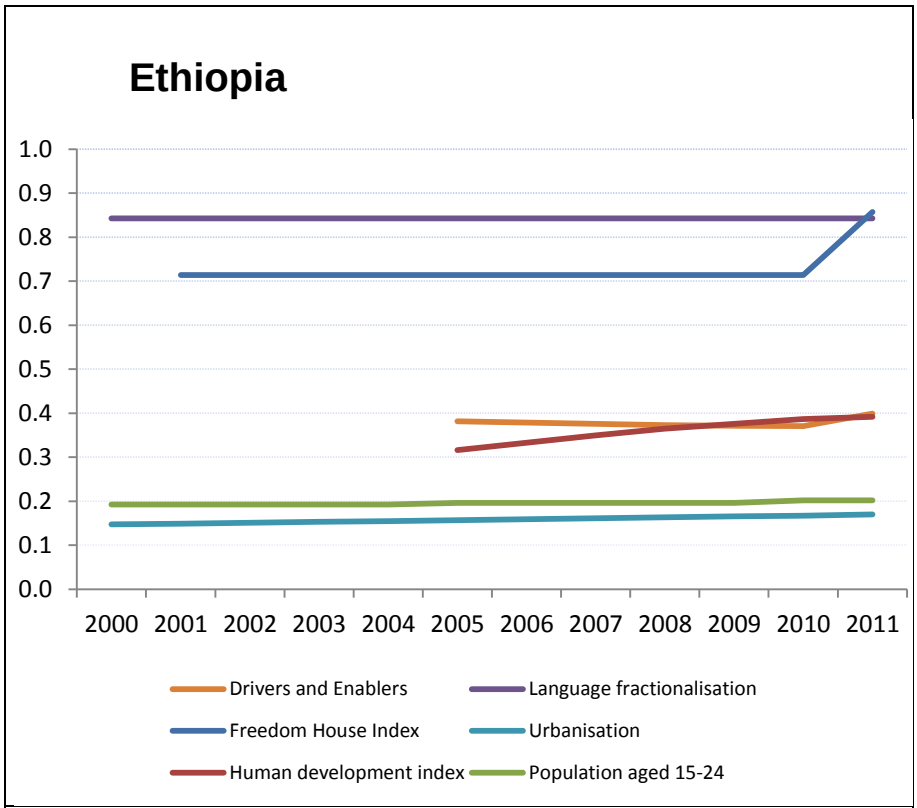
$$IntBandCap = \frac{International\ internet\ bandwidth/Internet\ User}{NormVal_{IntBandCap}}$$

Indicator	Comment	Source
IntUsers - Part of the population using the Internet		ITU World Telecommunication/ICT indicators 2012
MobSub - Mobile-		ITU

cellular telephone subscriptions per 100 inhabitants		
HouseRadio – Part of households that has a radio		ITU
IntCost – A ranking of how much a fixed Internet connection costs in relation to other countries in sub-Saharan Africa.	Uses GNI/Capita PPP.	The World Bank, ITU
IntBandCap – A measure of how much international Internet access is possible per Internet user, compared to other countries in sub-Saharan Africa.		ITU

Drivers and Enablers Component

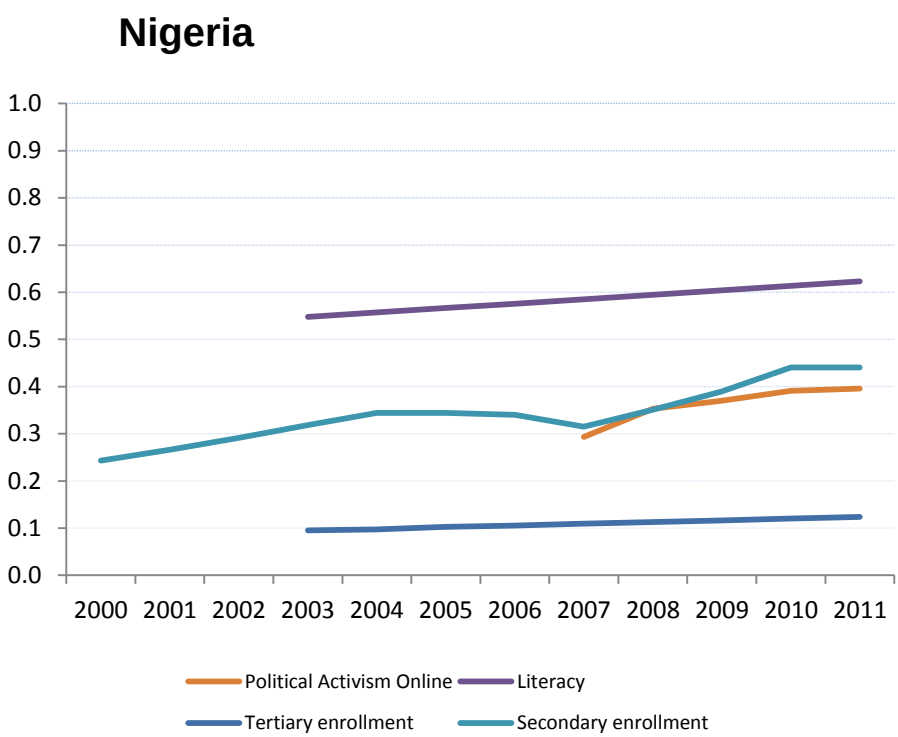


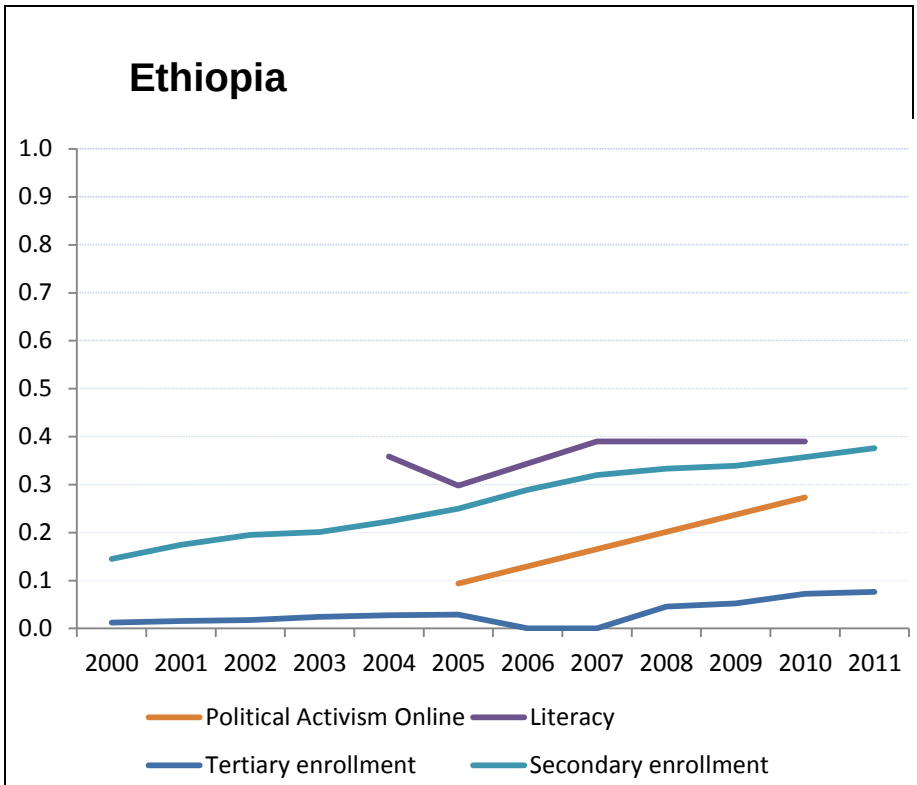


$$DandE = \frac{(Youth + Urban + (1 - HDI) + FHI + (1 - LingFract))}{5}$$

Indicator	Comment	Source
Youth - Part of population aged 15-24%		UN Population Division
Urban – Part of the population living in cities		The World Bank
HDI – Human Development Index.		UN Development Programme
FHI – Freedom House Index		Freedom House
LingFract – An index of linguistic fractionalisation		Desmet, K., Ortuño-Ortin, I. and Wacziarg, R., "The Political Economy of Ethnolinguistic Cleavages," NBER Working Paper #15360, September 2009.

Political Activism Online Component





$$PAO = \min(ICT, \frac{(Literacy + SecEnroll + TertEnroll)}{3})$$

Indicator	Comment	Source
ICT – The calculated ICT Component	The Political Activism Online (PAO) component is restricted by ICT accessibility, hence the min(x,y) function – it will take on the smallest value of either the ICT component or the PAO factor mean value.	See "ICT Component" above.
Literacy - Literacy rate, adult total (% of people ages 15 and above)	A pre-requisite for using ICT tools is literacy. This measure does not say anything about whether the population is literate in one of the major Internet languages or not.	The World Bank
SecEnroll - School enrollment, secondary (%	The school enrollment measures – secondary and	The World Bank

gross)	tertiary enrollment – represent an aggregated increased opportunity to access and make use of ICTs.	
TertEnroll - School enrollment, tertiary (% gross)		The World Bank

Countermeasures Component

ICT Countermeasures – influencing the infrastructure

$$CounterICT = (ONIToolsFiltering + \frac{1}{numISPs} + \frac{1}{numCellProv})/3$$

PAO Countermeasures – influencing the content

$$CounterPAO = (RSF + \frac{(ONISocial + ONIPolitical + ONISecurity)}{3})/2$$

Indicator	Comment	Source
ONIToolsFiltering, ONISocial, ONIPolitical, ONISecurity - Measures based on ONIs rating of Internet filter use in the country.	ranging from 0 to 1 where "No filtering" = 0 and "Pervasive filtering" = 1	ONI
numISPs – the number of Internet service providers active in the country.	A monopoly on Internet service provision makes it easier to implement infra-structural countermeasures and vice versa.	Freedom House
numCellProv – the number of active mobile telephony providers in the country	A monopoly on mobile telephony service provision makes it easier to implement infra-structural countermeasures and vice versa.	Freedom House
RSF – The Reporters Sans Frontières(RSF) "Press Freedom Index"		Reporters Sans Frontières

FOI, Swedish Defence Research Agency, is a mainly assignment-funded agency under the Ministry of Defence. The core activities are research, method and technology development, as well as studies conducted in the interests of Swedish defence and the safety and security of society. The organisation employs approximately 1000 personnel of whom about 800 are scientists. This makes FOI Sweden's largest research institute. FOI gives its customers access to leading-edge expertise in a large number of fields such as security policy studies, defence and security related analyses, the assessment of various types of threat, systems for control and management of crises, protection against and management of hazardous substances, IT security and the potential offered by new sensors.

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