Strengthening citizen agency and accountability through ICT: an extrapolation for Eastern Africa

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Abstract

We investigated the role of Information and Communication Technologies (ICT, namely mobile phones) in support of citizen agency and its potential in calling for authorities' accountability. We focused on Eastern Africa and we used a mixed methodology, which allowed us to explore the current uses of ICT to strengthen accountability and to forecast the growth of mobile phones' adaption in that region. Evidence from both analyses suggests that there are two main areas where citizen agency and ICT can reinforce each other in bottom-up and horizontal processes: participation and engagement of citizens, and the diffusion of information.

Key words: Information and Communication Technologies (ICT), citizen agency, accountability, empowerment, Africa.

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INTRODUCTION

Since the late 1990s, the prospect of using ICT (Information and Communication Technologies) to improve accountability, transparency, fairness, and effectiveness of authorities has attracted general optimism (World Bank, 1998). However, early hopes that e-initiatives would be the panacea of all the problems have given way to more modest claims. An aspect that has not received much attention so far is the use of ICT in support to citizen agency; to inform and involve communities, and enable them to interact and influence authorities. This continued interaction with citizens directly contributes to effective and ethical governance. There are quite a few examples of successful smaller projects in this realm, also in developing countries. But emerging technologies (e.g. mobile phones) create new momentum for strengthening citizen agency on a larger scale. The rationale we follow is that enabling citizen agency potentially creates action at a scale that existing development structures cannot achieve, simply because of the amount of actors that can be involved, and this can be supported even further by technology, that has scale intrinsically built into it. The scale effect will be most effective if it is not just bottom-up (citizens-authorities) but also horizontally, amongst citizens to create coalitions. A growing branch of research is investigating the use of mobile phones during times of repression or revolution (see Meier, 2007), but at the best of our knowledge, this is the first study on ICT and citizen agency, and its potential in calling for authorities' accountability. The main objective is to give a first insight into this issue, hopefully triggering further research.

The geographical focus will be on Eastern Africa (Kenya, Tanzania, and Uganda). The reason for this is twofold: i) these countries historically have a diverse and vibrant civil society sphere (Harbeson et al., 1996), ii) the penetration and growth rate of mobile phones is one of the highest in Sub-Saharan Africa (ITU, 2007). Both reasons make it a suitable and relevant region for our study.

Understanding *how* ICT can support citizen agency can be an important contribution to the design of development strategies, especially in Eastern Africa. The methodology makes use of both qualitative and quantitative data. The qualitative analysis aims to i) investigate citizen agency in developing countries , ii) identify how ICT can be used to strengthen it in light of transparency and accountability, with examples of uses in Eastern Africa and iii) the main obstacles that prevent ICT projects from going to scale. On the other hand, the quantitative analysis intends to forecast the adoption of mobile phones in Kenya, Tanzania, and Uganda in the coming years. The evidence from both analyses allowed us to sketch the potential for use at scale in the near future.

The paper is structured in five sections. The first section reviews literature focused on citizen agency in developing countries. It results in an overview of the pre-conditions that enable citizen agency. This will help us to determine and analyze the condition that brings citizens to become active citizens and how ICT can relate to this. The second section investigates the current uses of ICT and contextualizes them within the theory behind citizen agency and ICT. It also outlines the institutional and economic challenges around ICT growth that will need to be solved in order to achieve scaled, reliable and efficient citizen agency actions. In the third section we will build a scenario of the new technological possibilities for access and use of ICT in Eastern Africa in 5 years time. The theory, the current use of ICT and the technological scenarios will make it possible to sketch new uses and applications of ICT in support of citizen agency in the fourth part. The last part gives our conclusions.

1.0 CITIZEN AGENCY, ACCOUNTABILITY AND ICT IN DEVELOPING COUNTRIES: A THEORETICAL FRAMEWORK

Civil society has received enormous interest amongst researchers, policy-makers and donors since it has been seen as an essential actor for promoting democracy and good governance in developing countries, especially in Africa (Bratton, 1989). This conception rose during the 1980s, when after decades of development policies in sub-Saharan Africa characterized by a top-down approach, led to the unintended result of at the same time empowering the authorities and reducing the participation of the citizens (Easterly, 2006). Corruption and economic powers were alienating the authorities even further from the citizens. At the same time, different social movements claiming for justice and equality were still active and growing. Hence, development donors recognized that building and strengthening the civil society was a necessary change in order to achieve democracy and economic development in sub-Saharan Africa. The turning point was the World Bank's publication '*Sub-Saharan Africa: from crisis to sustainable growth'* where the failure of the structural adjustment programs was attributed to political, not economical reasons: "*underlying the litany of Africa's development problems is a crisis of governance*" (World Bank, 1989:60). In the new wave of development strategies following, a conceptual limitation was the given meaning of civil society; although the term civil society is widely used in policy environment and even in academic literature, its definition is ambiguous. In fact, from its origin in the ancient Greek philosophy, the meaning has continued developing across centuries and cultures: each social epoch has given rise to particular questions about human conditions and the value of social existence (Mafeje, 1998). Consequently, donors often used the term civil society with a "western" connotation and a normative meaning, resulting in the identification of civil society as civic organization such as advocacy groups working mainly on public causes in the sphere between the State and the market. This definition and description of civil society seems limited and cannot be fully appropriate in the African environment. The main reason lies in the fact that the concept of civil society was born and developed in a specific historical period in Europe and that it may be not relevant in different cultural and political situations (Lewis, 2002). As a matter of fact, in Africa traditional organization and self-managed groups of people have been *de facto* excluded by development policies, even if they have had an important role in the social and political environment. To increase the efficiency of policy and projects, policy-makers and development donors could have used the term "civil society" with a wider meaning, taking into account those realities that traditionally have not received broad attention, i.e. a wide range of societal groups that work to protect "collective" interests. They include a wide variety of movements that traditionally are called interest groups, such as NGOs, 'labour' and 'student' unions, and communal associations. The main difference between these organizations and what at the beginning of 1980s has been defined as civil society is that these organisations can work at an informal level, in self-help activities and they are often embedded in the social and traditional environment (Maina, 1998 cited by Lewis, 2002). We call this broader and more inclusive definition of civil society including the individual actions of citizens, "citizen agency".

The richness of citizen agency movements in Africa, specifically in Eastern Africa, and the new technological spread we are assisting are the two *leitmotives* that together motivate this paper and make it a relevant study case. In fact in the last years new telecommunication technologies have had a massive penetration in developing countries. Based on the International Telecommunication Union (ITU) statistics, in 2009 61% of the world's mobile phones are in developing countries and Africa is currently the fastest growing mobiles market worldwide with more than 300 million subscribers and over 30% of mobile phone penetration

in 2008. Mobile phones are becoming available and affordable to billions of people that are at the margin of the economic and political system. This increase in access raises the questions of: how technologies can be used to empower people and more importantly how they can make use of technologies for self-empowerment? The following sections aim to shed some light on these questions, to define the expression "citizen agency" and to analyse the conditions that allow for citizen agency.

1.1 The role of citizen agency and its action in a political system

With the expression "citizen agency" we refer to the activities of people that participate at the social and political life and somehow have the capability to influence the decision making process. Rajani (2008) adds "citizens agency is not only the purpose – or the ends – of development and democracy, it is also its most effective means." People that act as citizen agents are initially moved by injustice, inequality or discrimination. Those people can be "activist citizens", engaged in writing scripts and creating the scene, but also just "active citizens", which follow scripts and participate in scenes that are already created (Isin, 2008). Both characters are fundamental for effective actions. For citizen agency to work people need to be in good health and educated, have confidence and rights secured, be able to access information and express themselves in order to make things happen and fight against injustice and unfairness. Additionally they must have the conviction that they can make changes. Historically in developing and developed countries activist and active citizens have pushed many big important changes – women's equality, racial equality and concern for environment. Without those acts driven by courage and creativity, as Isin (2008) argues, it is not possible to imagine social transformation or to understand how people become citizens as claimants of justice, transparency, rights and responsibilities.

Participation and empowerment are strictly connected and both are pushed and motivated by the feeling to be part of a community. These communities can be a State or communities based on culture, tradition, religion, or social groups. Hence, people can participate in the public life not just because of personal empowerment but also in terms of citizenship rights and responsibilities. In that perspective, Lister (1997) argues that citizenship can be seen as the formal right to enable people to act as agents. From a vision of democracy in terms of representation, where citizens are voters and rights-bearing individuals, the concept of democracy has moved to an idea where the authorities' role is to enable participation and community feeling (Boyte, 2008). This idea can reflect the restricted meaning of civil society illustrated earlier. As soon as we think in terms of citizen agency, the role of citizens in a participatory democracy may become rather reductive. A new structure of democracy might emerge, in which citizens are co-creators and the main active actors of social and political changes. This is what Boyte defines as developmental democracy. If a representative democracy is based on structures and participatory democracy focuses on processes, developmental democracy "*focuses on the work of growing capacities for self-directed collective action across differences for problem solving and the creation of individual and common goods*" (Boyte, 2008:2). It conceives of a democracy as a society, promoting action across state, civil society, and market and where, as Sklar (1987) points out, authorities are clearly responsible and accountable for their actions in front of the membership.

Developmental democracy is then made by organized and informed people. Formally, we can identify two main organizations through which citizens can act: mutual benefit organizations and public benefit organizations (Bergdall, 2001).[2] The mutual benefit organizations are

[2] Although this distinction origins from legislation fields, it clearly explains the different components of citizen agency.

formed to benefit its members. In principle they are shaped by and accountable to its members. These organizations include cooperatives, trade unions, and professional associations. On the other hand, public benefit organizations are formed to serve the common interest of society, and their mission is based on common perceptions and values of self-selected citizens who are assumed to be public spirited. They are including philanthropic organizations, civic organizations, advocacy groups, and welfare and development NGOs, both local and international.

1.2 Conditions that enable citizen agency

According to the definition, citizen agency is driven by people but it needs some form of accountability from the authorities to take place. For that reason, some basic conditions are needed in order to allow people to be citizens with the capabilities to actively participate at the socio-political life. In the literature several studies[3] are found that analyse those preconditions; still two main strands are found:

- Community identity: People must feel part of a community with shared concerns and interests that will eventually lead to collective actions for claiming rights. The agency is not just the capability to choose and act but also about the conscious capacity that to be involved is important to the individual's self-identity (Lister, 1997).
- Individual and community empowerment: Community empowerment is a prerequisite for community participation (Sen, 1999): citizens need to have a local authority worth taking charge of. Individuals are willing to participate at the political life only if they feel that somehow they are able to make a difference. People must be empowered in order to feel able to influence the decision making process: local governments or decentralization is seen as a way of empowering communities through the mechanism of participation (e.g. local level planning, resource mobilization, administrative and judicial powers) (Simeen, 2004).

The freedom of press and speech is an important condition; still research on its relation with citizen agency is ambiguous. From the theory of Lipset (1959) that media's access is one of the essential preconditions for mass participation, many studies have been conducted but yet with no strong evidence (Norris, 2009). Nonetheless, examples around the world suggest that information is a necessary condition but not sufficient for citizens participation. Information may not be a pre-condition, but it still remains an important factor that helps citizens' acts.

At the base, we see that individuals' actions are moved by needs, ideas and beliefs; people need a situation which forces them to act: an injustice, or something that threatens them in their livelihood or well being. But the preconditions that allow citizen agency do not imply that the citizens are active. In Simeen (2004) the main capabilities that make citizen participation possible are found:

1. Participation and engagement require basic social, human resources, and time.
2. Deliberation and participation necessitate physical and institutional resources; apposite rules for deliberation and conflict resolution and information.
3. Mechanisms for building trust reduce inequality and increase access.

If ICT can be integrated and implemented in those steps, it can become a tool to give capabilities to the users: if so, it is not only a tool to empower people, it gives people the capacity for *self*-empowerment.

[3] For a review, see Lister, 1997 and Simeen, 2004.

2.0 A QUALITATIVE ANALYSIS: HOW ICT IS SUPPORTING CITIZENS AGENCY? EXAMPLES FROM THE FIELD

When citizens want to be engaged, they need information to be aware, communication to organize actions, organisation to make their action more effective and feedback to have results. ICT can be then used in those fields as a new tool in support of citizens' actions. The main innovation that new information technologies offer is that they are bidirectional – or multidirectional in case of Internet - and real time tools. Bidirectionality empowers the users and makes information updated in real time. Taking advantage of these characteristics, ICT can support the capabilities that allow citizen agency (§1.2) and in general the three main pillars of civic engagement (Norris, 2001): what people learn about public affairs (political knowledge), the public's orientation of support for the political system and its actors (political trust) and conventional activities designed to influence authorities and the decision-making process (political participation). This section aims to illustrate how ICT is already been used in support to citizen agency and investigate why most of those examples are still at small scale.

2.1 Methodology

The analysis is based on primary qualitative data. In July 2008 Hivos (Humanist Institute for Cooperation with Developing Countries) administered an online open questionnaire and asked relevant experts on ICT and development their contribution. The choice to use an online questionnaire is motivated by the desire to reach people worldwide in the most efficient way. The questionnaire was sent to three ICT and development mailing lists, and to Hivos staff worldwide. The recipients received a personal email in which they were asked to participate in an online survey. The questionnaire was administered in English. A reminder was subsequently sent after two weeks. The questionnaire aimed to cover three main aspects of ICT in support of citizen agency: how ICT is currently used; where the implementation of scale of many small projects struggle; and how they will image new uses in the coming years. There were 46 respondents out of 680 potential respondents; 31% of the respondents were based in developing countries and half were working in the field of ICT for development. The response rate of 6.8% was slightly lower than expected (Kaplowitz et al., 2004). Although it is not possible to confirm it, the main reason may lay on the fact that several email addresses could have been in more than one mailing list, increasing only virtually the size of the sample.

The geographical focus will be on Eastern Africa (Kenya, Tanzania, and Uganda). The reason for this is twofold: i) these countries historically have a diverse and vibrant civil society sphere (Harbeson et al., 1996), ii) the penetration and growth rate of mobile phones is one of the highest in Sub-Saharan Africa (ITU, 2007). Moreover, in those countries Hivos has worked for decades and can boast a strong network of practitioners.

2.2 Current uses of ICT

To collect information on the current uses of ICT on the ground, it was asked:

> *"What examples from the field do you know are strong in enabling citizens through new technologies to make their voices heard and/or influence the societies they are part of (e.g. monitoring election, accessing media, monitoring the quality of local service delivery)?"*

Most of the respondents (55%) suggested the use of ICT as a tool to get or spread information or monitoring authorities' actions, thirty one percent to organize citizen actions, and the remaining fourteen percent a mix of uses of ICT that can be clustered in two main groups: uses of ICT as a business tool or to enhance capabilities. The following two sub-sections will

focus on the first two suggestions, since together they account for more than fourth fifths of the answers.

2.2.1 ICT as a tool to get or spread information or monitoring authorities' actions

According to Mundy *et al.* (2001) "information is useful only if it is available, if the users have access to it, in the appropriate form and language". Information then should not be the abstract supply-driven kind; it should be concrete, practical, and user-friendly. By definition information has to be demand driven and responsive, not only at national level, but it should also be at very local scale. Ordinary people must have the possibility and ability to search whatever they want and get the information in a quick, reliable and affordable manner (Rajani, 2008). An essential use of information is for monitoring authorities. Often people do not have a chance to know or track what the governments are actually doing. Access to information and independent media will help; but in addition it is necessary to develop tools for citizen monitoring of public bodies and public resources. Current major examples of ICT as information and monitoring tools can be grouped in: crowd sourcing tools (e.g. Ushahidi), monitoring authorities (e.g. Bungesms and Mzalendo), participatory news media (Global Voices), and platforms for debate in local languages (e.g. Jamiiforums).

2.2.2 The use of ICT to organize citizen actions

ICT can be also used to facilitate and make work of organisations more effective. Often activists are far from each other, and in environments where infrastructure is poor ICT can provide a revolutionary tool to organize and get in touch with people at very low scale costs. Moreover, the fact that ICT is immediate and bi/multi-directional, gives flexibility and interaction. Phone numbers also create a new form of identity; it provides a stable fixed point of reference to the outside world where before was not possible due lack of infrastructure (Chipchase cited by Rees, 2008). The uses of ICT as an organizational tool can be aggregated in two main groups: tools for organizations to work and communicate better (e.g. FrontlineSMS, Tactical Tech, Dgroups), and those that enable citizens to connect and act (e.g. Nabuur).[4]

2.3 Why so far is ICT not used for citizen agency on a large scale?

We listed examples from the field where ICT has been used to organize more people, influence authorities and demand accountability. Most of the current uses however are at small scale or even pilot projects. Often pilot projects are relatively successful, as the people responsible for the implementation focus attention, energy and enough resources on it. Therefore the following question needs to be addressed: what are the main blocks and obstacles that prevent pilot project to go to scale? The relevance of this question is that the strength of ICT is embedded in the technology itself[5] and its potential benefits (and externalities) have a "snowball" effect related to its spread. The result is that citizen agency potentially creates action at a scale that development structures unlikely could manage, and this can be supported even further by technology that has scale intrinsically build into it. Mobile phones for example are ubiquitous in almost every African town and bottom up innovations show its possibility for success at scale (e.g. m-banking in Kenya). It is the combination and the adaption of the two that could foster change at scale.

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[4] Other websites and services, such as Twitter, Facebook, and Youtube, that have not primary been designed to support citizens' actions in developing countries, are widely used by activists. Mobileactive.org collects many guides and anecdotic analysis on the use of those tools for citizen media in low-income countries.

[5] At the base of this is the Metcalfe's law that states that the value of a telecommunications network is proportional to the square of the number of connected users of the system (n^2).

The questionnaire included the following question:

> *"Worldwide we can see many successfully ICTs pilot projects. In your opinion, what often obstruct their implementation to scale?"*

From the respondents' output, the main reasons are threefold. The lack of economic resources have been indicated by 38% of the respondents; 23% of them pointed out the political interferences, and 32% suggested that the main obstacle to scale up is bad design/implementation. The remaining 7% of the answers were not directly pertinent to the question. Table 1 summarizes the main issues.

Table 1: Main blocks and obstacles that prevent pilot project to go to scale

Reason	Examples
Lack of resources	• Economic and financial sustainability: economic resources are enough only for pilot scale. • ICT does not directly improve key realities (health, livelihood, literacy) and as a consequence it may not get the needed funds allocated.
Political interference	• Political interferences can change project's aims. • Corruption between stakeholders can jeopardize efforts and efficiency.
Bad design or wrong implementation	• Introducing a wrong technology may not solve real needs of people. • Beneficiaries may not be involved in the projects implementation. • Projects may not consider technologies' externalities. • Lack of entrepreneurship model or management with unskilled qualities.

3.0 A QUANTITATIVE ANALYSIS: THE MOBILE PHONES PENETRATION IN EASTERN AFRICA IN THE COMING YEARS

So far we have explored how the interactions and the participation between active citizens and effective governments can be at the base for political development and how ICT has been used in this context. To investigate on the future potential use of ICT, it is necessary forecast how ICT itself will be developed, with a focus on the Eastern Africa countries. This is the aim of the section.

Before advancing to the technological scenarios, it is important to revisit the conditions that allow the spread of ICT in developing countries. Five are the critical points:

- Energy: new technologies are electrical equipment that needs electric power to work. In many areas in developing nations electric supply is irregular or not available.
- Connectivity: Mobile phones and PCs require a network to connect to Internet. Rural and remote areas often lack the network infrastructure.
- Literacy: ICT requires skills and literacy to be used. In that context, the use of mobile phones is easier than a PC.
- Income: New technologies need money to be purchased (or rented) and to be used (electricity and fees).
- Need: ICT must solve real needs. ICT should be part of the solution and not a so-called "boomerang tool", where the benefits that a new tool brings are less than the negative externalities.

The starting point to build a scenario is to think first what will be the technology most used by citizens in developing countries to get information and to interact with others. We can say that a predominance of either mobile phones or laptops is not foreseen: the next generation of devices will be a mix of both technologies. In fact this is the main finding that emerges from the questionnaire, where 74% of the respondents agreed on the supremacy of mobile phones. That device will have the user-friendliness and manageability of mobiles phones and the advance features of laptops. For the first time people will afford a unique device with embedded communication, informatics, media and photo tools. The envisioned convergence

between old communication media (i.e. radio) and new communication (i.e. mobile phone) will be an essential and critical point in order to meet people's needs.

3.1 The current mobile phones penetration in Eastern Africa

At the moment mobile phone networks in developing countries cover 45% of the population and in the whole Africa the mobile cellular subscribers are 28.1% of the inhabitants (ITU, 2007).[6] From 2007 Africa has become the fastest growing mobile market in the world. In Eastern Africa mobile phone subscriptions grew by 67% over one year to September 2007; the sub-region recorded the highest growth in Africa over that period. Table 2 summarizes the key data for Eastern Africa, which can be compared with the aggregate data for the whole Africa. The main form of fee is pre-paid contract; in Kenya and Uganda, only 3% of the mobile phones are fixed contract (Gillwald, 2008).

Table 2: Mobile phones penetration in Eastern Africa (2007)

	Mobile phone subscribers[a]					% Covered[b]	
	2002 (000s)	2007 (000s)	CAGR[c] 2002-2007 (%)	Per 100 inhabitants	As % of total phone subscribers	Area (2006)	Population (2006)
Kenya	1,187.1	11,440.1	57.3	30.48	97.7	32.1	91.8
Tanzania	606.9	8,252.3	68.5	20.4	97.2	13.1	55.7
Uganda	393.3	4,195.3	60.5	13.58	96.3	79.3	96.9
Tot. Eastern Africa	2,187.3	23,887.7	62.1	21.48	97.2	41.5	81.5

Source: a. ITU Database, b. Buys *et al.* (2008), c. CAGR is the acronym for "compound annual growth rate".

3.1.1 Methodology

Based on the current mobile phone penetration, an estimation on the number of mobiles subscribers in 2014 is estimated with logistic and the Gompertz models: both models have been widely used for forecasts in the telecommunication sector because of their S-shaped curve that can reproduces the technology adaptation.[7] For the analysis the approach used by Singh (2008) to estimate the diffusion of mobile phones in India is followed.

The logistic model can be written as:

$$Md_t = \frac{\alpha}{1+\exp(-\gamma-\beta(time)_t)} + \varepsilon_t \qquad (1)$$

In this model Md_t is the mobile density at period t, α the saturation level, β the shape of the curve, γ its location, and ε is the error term.

Using the same terminology, the Gompertz model can be written as:

$$Md_t = \alpha \exp(-\exp(-\gamma - \beta(time)_t)) + \varepsilon_t \qquad (2)$$

The main difference between the models is the inflection point, i.e. where the marginal growth starts to decrease. Setting α equals to 1, the inflection point is 0.5 for the logistic model and 0.37 for the Gompertz curve.[8]

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[6] This figure is comparable to the OECD level in 2000.

[7] For a literature review on models and technology diffusion, see *inter alia* Geroski, 2000.

[8] If we set α=1, from equation (1) the maximum marginal growth is when $\alpha\beta/4 \rightarrow Md_t=\alpha/2=0.5$, i.e. it is symmetric to its inflection point. Instead, from equation (2) the inflection point is at $\alpha\beta/e \rightarrow Md_t=\alpha/e=0.368$

The data used are available from the ITU database[9] and they measure the mobile penetration in Kenya, Tanzania, and Uganda for the years 1995-2008. We estimated models (1) and (2) using a non-linear least square method and each model has been run with seven different saturation levels (α): 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, and 1.[10] The saturation level is the maximum level supposed that mobile phones penetration can reach within a country (e.g. 0.4 is equivalent to 40% of the total population are subscribers). The forecast for the next years are built based on the model that fits the data better in terms of adjusted R-square and MAPE (mean absolute percentage error)[11] for the last eight observations (2000-2008).

3.1.2 Interpretation of the results

Both models have high values of adjusted R-square and significant parameters but in each sample the logistic model presents better MAPE compare to the Gompertz model.[12] This can be derived from a homogenous growth of mobile adaptation within the countries. The best model for each country shows different saturation level: 0.4 for Tanzania, 0.8 for Kenya and 1.0 for Uganda. This is consistent with the economic and demographic characteristics of each country (table 3). The lower data for Tanzania depend on its network, which covers 55% of the population (this is due to a low population density). Kenya has a lower network coverage compare to Uganda; this is consistent with the fact that Kenya presents a higher percentage of people living under the national poverty line.

Table 3: Economic and demographic parameters for Kenya, Tanzania and Uganda[a]

	KENYA	TANZANIA	UGANDA
Current mobile phones penetration	0.43	0.27	0.25
2014 Forecasted mobile phones penetration	0.8	0.4	1
Network covered (% of Population)	91	55	96
Rural people (%)	41.3	75.1	87.1
People living under the national poverty line (%)	52	35	37
Density population (people per Km^2)	59	41	119

Source: a. United Nation Database (data.un.org).

Graph 1 shows the mobiles penetration and subscribers for the next 5 years for each country in Eastern Africa. The number of subscribers is weighted yearly on the estimated demographic growth based on the World Population Prospect 2006 by the UN Department of Economic and Social Affairs.[13] Table 4 summarizes the trends.

Graph 1: Forecasted mobile phones diffusion in (a) Kenya, (b) Tanzania, (c) Uganda

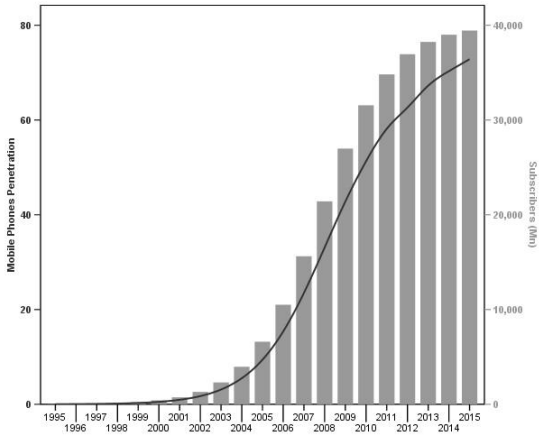
[9] Data available at www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx and data.un.org .

[10] Singh (2008) argues that in developing countries it is common having mobile phones penetration over 100% (a > 1). This is due the fact that its level of saturation depends on many factors, but mainly on penetration of landlines; where landlines are not wide developed, the saturation level of mobile exceeds 100%. In Eastern Africa income and network coverage are important factors for mobile phones penetration. For that reason and since in 5 years those factors will not notably change, we did not consider value of a greater than 1.

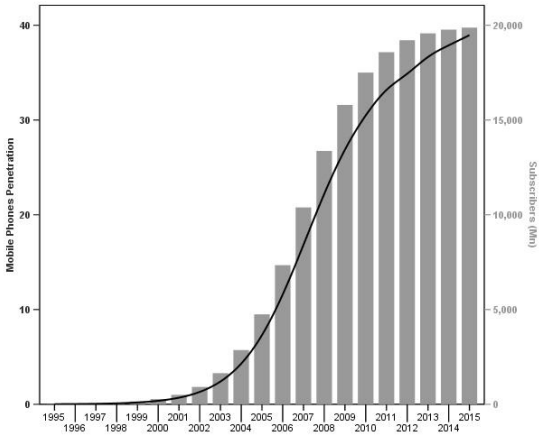
[11] The MAPE has been calculated as following: $MAPE = \frac{1}{n}\sum_{t-1}^{n}\left|\frac{A_t - F_t}{A_t}\right|$, where A is the actual value, F the forecasted value and time *t*.

[12] The full estimated parameters are available upon request.

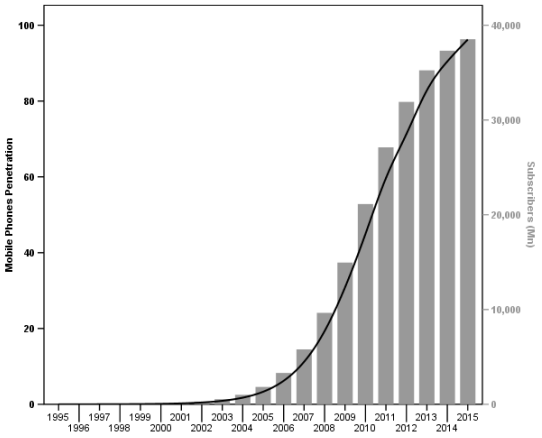
[13] Data available at http://esa.un.org/unpp.



(a) Kenya



(b) Tanzania



(c) Uganda

Table 4: Mobile phones penetration (Pen.) and Subscribers (Sub.) in Eastern Africa, 2008-2014

	2008		2010 (EST.)		2012 (EST.)		2014 (EST.)	
	Pen. (%)	Sub. (000s)	Pen. (%)	Sub. (000s)	Pen. (%)	Sub. (000s)	Pen. (%)	Sub. (000s)
Kenya	43.64	16,853	63.10	25,646	73.89	31,317	78	35,152
Tanzania	27.04	11,227	35	15,240	38.42	17,440	39.53	18,936
Uganda	25.00	7,764	52.83	17,987	79.78	28,517	93.29	36,176
Tot. Eastern Africa	31.9	35,844	50.31	58,873	64.03	77,274	70.27	90,264

Based on the estimations, Eastern Africa will continue to have a remarkable growth rate; this trend is also supported by qualitative analyses (Blycroft, 2008) and national telecommunications authorities (Communications Commission of Kenya, 2008). It is important to remind that the mobile phones penetration refers to the number of subscribers and not the actual number of users. In the African context it is common that users own more than one SIM because companies apply different fees and can have different network coverage. Sutherland (2008) estimates that more than 18% of the total users' estimation is double or triple counting. Heeks (2009) hypothesizes that in Africa in-country mobile ownership is 75% of the subscription.[14] At the same time, he adds that mobile phone subscription figures are underestimates for at least two reasons: private mobile phones are

[14] As Heeks notices, this estimation can be inconsistence with demographic data. For instance, in Eastern Africa around 42% of the population is under 14 and unlikely half of them own a mobile phone. Data from World Population Prospect 2006 by the UN Department of Economic and Social Affairs.

shared with family, friends, neighbours, and public mobile phones are accessible to large numbers of people.

4.0 DISCUSSION: NEW APPLICATIONS AND HOW TO UP SCALE THEM

In Eastern Africa there is a diverse and vibrant civil society sphere and understanding *how* ICT can support citizen agency and better governance can be an important contribution to the design of development strategies in that region. Examples around the world suggest that the ICT's potential can be considerable: it is not a matter of technologies anymore; it is more a matter of imagination, adaptability, and mere time. This is not only limited to the context of citizen agency, it is likely that the wide success of ICT and its scale will not lie in complex devices or advanced usage, but whether or not the technology is usable and relevant to people. For this reason it is important that applications and software originate from the field, instead of merely importing them, and they should be in languages that every potential user could understand.

Based on the technological scenario, how will the basic conditions that allow the spread of ICT (§ 3.0) be met in 5 years time?

- Energy: Alternative sources (i.e. solar panels) will increasingly provide energy and its success will depend on how the solar technologies will be efficiently implemented in mobile phones' batteries.
- Connectivity: The forecasting models have given evidence that in the medium term the mobile penetration will not be arrest, reaching in Eastern Africa levels of subscribers' number not dissimilar to the current level in OECD countries. There is not enough data to forecast Internet connection, in any case it is expected that most of the connection will be through mobile phones.
- Literacy: The uses of intuitive, simple devices will partially overcome literacy problems. Vocal and voice based systems partly overcome this problem as well. Young new users will be on average more educated than their parents. Next to that, making more use of local languages is related to this issue as well.
- Income: Manufacturers will produce cheaper devices that will become affordable for more and more people. However, in 5 years it is unlikely that devices will cost under USD15-20. But a likely future reduction of governmental taxes on mobile phone fees may include additional users. East Africans currently pay taxes between 25% and 30% on mobile phone services, compared with an average of 17% across Africa (GSM Association, 2007).

Income, literacy and connectivity will not be the main blocking points for the spread of new and more advanced devices in Eastern Africa.[15] The success of ICT in support of citizen agency will be based mainly on whether or not technology will be usable and relevant to people and addressing their real needs and in minor part on how alternative source of energy will be adopted. In the questionnaire we asked the respondent which ICT's uses will support citizen agency in the next 5 years. In general, it has emerged the importance of anthropology fieldworks[16] on the uses of mobile phones and Internet applications. That because the key

[15] We refer specifically to new ICT devices, not just the basic mobile phones but neither device developed and marketed for the high-income countries. This forecast does not clash with the current debate on digital divide, in which the International Telecommunication Union "*although the digital divide is still significant, it is slightly shrinking, especially between those countries with very high ICT levels and those with lower levels*" (ITU, 2010:iii).

[16] *Inter alia*, see the work of Chipchase (www.janchipchase.com).

point is to know what people actually do with their mobile phones instead of what we hope they can do. From the respondents' point of view information and organization seem to remain the main field of new applications in the near future.[17]

In the field of information two main developments are likely to be seen. On the one hand ICT will become further integrated into old media. Journalism will make more use of blogs, live coverage and real time video in addition to radio and newspaper. A new generation of bloggers is expected to emerge, distributing information within their community as well as making it available for the rest of the world. Websites such as Global Voices already aggregate local news and make it available for the international audience. On the other hand ICT can play a more intensive role in the field of monitoring elections and the accountability of politicians. In Eastern Africa there have been some examples (e.g. Kenya[18]) of these applications at national level, but bigger changes can be made if ICT is used to monitor local elections because at that level the citizens can directly make changes. Moreover worldwide examples suggest that ICT has been used in citizen actions in both free and more interestingly, in repressive environments.[19] In 2007 during the government repressions in Myanmar, live blogging and the use of mobile phone made the citizens' voices heard outside the country despite the government attempting to block all websites and services that carry news or information.[20] Similarly ICT has been used in support of protests and manifestations in countries like Ukraine[21] and Philippines,[22] where there is a relative freedom of press and voice. These examples, where ICT supports citizen action in repressive environment, seem to confirm a correlation between freedom of voice and press and citizen agency although evidence suggest that there is no significant relationship between mobile teledensity and anti-government protests or major government crises (Miard, 2009). There is a lack of comprehensive research into this topic and insufficient definition on this relationship (§ 1.2) but it is relevant notice how ICT can support citizen actions in repression environments.

The organization of citizen agency will be further supported by new ICT applications. They will reflect citizens' movements in their diversity: the development and the internal organization of such movements will drive the use of technologies. In this context the decentralized nature of citizen agency could make enormous advantage from the peculiarities and flexibility of ICT tools. Also geographical information will be massively used both for information's dissemination and for organization purpose; the live position of the authors and users will be included in the real time information. Integration of GPS information in software such as Twitter, Google Maps, FrontlineSMS or Ushahidi will expand their uses. New software solutions will be able to analyze all the contributions submitted by the users in case of special events (e.g. crises, natural disasters, etc.) and determine which ones are likely to be more relevant and reliable.

Finally, ICT may also change the traditional power balance between rural and urban areas. It can allow remote rural communities to directly interact, bypassing the centres of information

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[17] It is important to recall that in any case social and political preconditions are needed for citizens actions (§ 1.2).
[18] See Goldstein and Rotich, 2008.
[19] For a review of examples, see *Mobile Phones and Social Activism - An Ethan Zuckerman White Paper*. Document available at: http://mobileactive.org/mobile-phones-and-social-activism-ethan-zuckerman-white-paper
[20] See Chowdhury, 2008.
[21] See Goldstein, 2007.
[22] See www.time.com/time/asia/asiabuzz/2001/01/23/

and control. As a consequence, the “rural periphery” could directly network itself, not relying on the urban centres.

CONCLUSION

Focusing on Eastern Africa as a study case and considering the preconditions that allow citizen agency (§ 1.2), current examples of ICT in support of citizen agency, the barriers hindering use at scale (§ 2.2 and 2.3) and the expected increase of users (§ 3.1), there are a few main areas where citizen agency and ICT can reinforce each other: participation and engagement of citizens, and the diffusion of information. Both will contribute to transparency and accountability.

The main potentials and challenges for ICT in order to be more effective are twofold. First, an enormous potential of ICT can be found in the practice of being informed, involved, influential, both horizontally and vertically - from the local to the national (or even global) spheres. Here coalitions of growing spirals of connectivity amongst local initiatives of citizen can be built. Mobile phones, sms, and Internet are all new forms of such networking and coalition building initiatives. These technologies have a lot of potential ascribed to them and due to their characteristics they have scale built into them. The scale must be explored not just bottom-up but also horizontally; the value and the power of technologies is proportional to their diffusion. The second potential of ICT is the ability it has to make alternative voices heard. Taking the examples made by Tandon (2008), imagine how the voices of Mahatma Gandhi or Nelson Mandela could have been amplified by the use of ICT and how their charisma and their strength could have reached and inspired even more people than they already did. The downside is as always that the possibilities can be used both for the good and the bad. The Nazis made use of propaganda films by Riefenstahl, and also Bin Laden have used the internet. Both examples however are less about interaction and more about mere propaganda. We found evidences that in Eastern Africa many different formal and informal groups of citizens are active and that the tools (i.e. technology) to make their actions more efficient are getting widely available. Thus, what is currently happening in Europe and United States where people more and more use ICT in support of a cause, in the near future it can increasingly taking place also in Eastern Africa. In spite of different social and political environments, the technology (mobile phones) and the aim (make the people voice heard) can be the same, but the people are the ones that shape the ICT’s uses. If ICT will be able to take those opportunities, it can become a visionary tool in the hands of active and creative citizens.

Our findings are only a first step in understanding how information technologies can effectively support citizen agency. We see at least two areas where more research would be helpful. First, a more comprehensive theoretical framework on how the actions of citizen agency change related to the contraposition between a request for ethical and effective governance. Moreover studies cases in other geographical and cultural contexts may enlighten diverse uses of ICT in the demand for authorities’ accountability. This is also left for further research.

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