

The Impact of Connectivity in Africa: Grand Visions and the Mirage of Inclusive Digital Development

ABSTRACT

Corporations, development organisations and governments have launched ambitious programmes to ‘connect the unconnected’, reasoning that this creates economic growth and inclusive development. This paper contrasts these actors’ discourses with evidence from academic research. The evidence suggests a highly uneven economic impact of Internet connectivity across geographies and social strata. The analysed sources of discourse (African ICT policies and reports by international organisations) instead propose Grand Visions of connectivity, attributing a self-evident positive, widespread, and transformational impact to the Internet. We discuss technological determinism, acontextual modernism, and optimistic simplism as underlying this contrast, calling for more reflexivity towards the opportunities of ‘digital development’.

Keywords: connectivity, Internet, discourse analysis, economic development, inequality, modernism, digital development

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INTRODUCTION

Vast sums of money have been invested in projects and plans designed to connect the world's remaining four billion people without an Internet connection. These ambitious schemes often present digital connectivity as an instrument to achieve a range of social and economic developmental goals. This is especially the case for Africa, where Internet penetration rates remain relatively low, while the need for effective development strategies continues to be pressing. For instance, a report by Deloitte commissioned by Facebook's Internet.org states:

The Internet offers unprecedented opportunities for economic growth in developing countries. By providing access to information, connecting people to businesses everywhere, and opening up new markets, the Internet can transform the very nature of an economy and support economic development (p. 3).

Despite the vigour of such claims, there remains a lack of academic consensus about the actual impacts that digital connectivity (i.e. the Internet) will have on economic development. This paper contrasts claims made about the impacts of connectivity with the evidence available to support those claims. It contrasts a discourse analysis of claims made by African governments and large international institutions with a review of available evidence.

The paper focuses on three research questions: (1) What are international organisations and African governments claiming and assuming about the impact of connectivity on economic development, in terms of both growth and inequality? (2) How are those claims and assumptions supported? (3) What evidence has been ignored?

We analyse a wide array of policy documents and reports, and find that almost all make claims that increasing connectivity leads to economic growth and widespread social development. Interestingly, those documents either do not cite any evidence to support their claims or they use non-rigorous and potentially biased studies as evidence. The claims are usually underpinned by four key rationales that are framed as self-evident: (1) The Internet transforms economies and leads to growth by improving existing processes of value creation (productivity, efficiency, cost reductions, etc.) and by creating new, additional economic value (consumer surplus, innovation, opening new markets, etc.). (2) The Internet is a viable means to forge economic, social, and political inclusion that can mitigate existing inequalities. (3) The Internet would have even greater impact if public, private and development organisations enabled it more than they currently do.

Only few of these rationales are supported by our review of evidence. The review shows that the Internet can indeed have a positive impact on economic growth, but only under certain conditions, such as a threshold level of existing users and infrastructure. Further, the reviewed evidence highlights that the Internet's effect on inequality could actually be positive (i.e. inequality-enhancing), but generally there is no reliable evidence base. Overall, the Internet is embedded with social and economic life, while unidirectional 'transformations' are rarely observed. The rationales that are propagated in current discourses about the impact of connectivity thus appear to be at least overblown, if not misleading.

PLANS TO CONNECT THE WORLD

Visions and plans of bringing connectivity to the disconnected are rarely lacking in ambition. Both the private and public sectors are racing ahead with plans to connect the world.

In the private and philanthropic sector, such plans take their most global shape. Facebook and Google, for instance, are investing in projects that aim to connect *all* of the world's remaining four billion people that have never accessed the Internet (see Figures 1 and 2). Facebook's project, Free Basics, aims to do this through contracting with mobile phone operators. The organisation also announced to use satellites to 'beam Internet access down into communities from the sky' (Thielman, 2015). Google's projects, Project Link and Project Loon, aim to build urban fibre networks and use high-altitude balloons to cover the world with access. Both plans make Africa a priority.

Figure 1. Screenshot of Internet.org website (<https://info.internet.org/en/>)

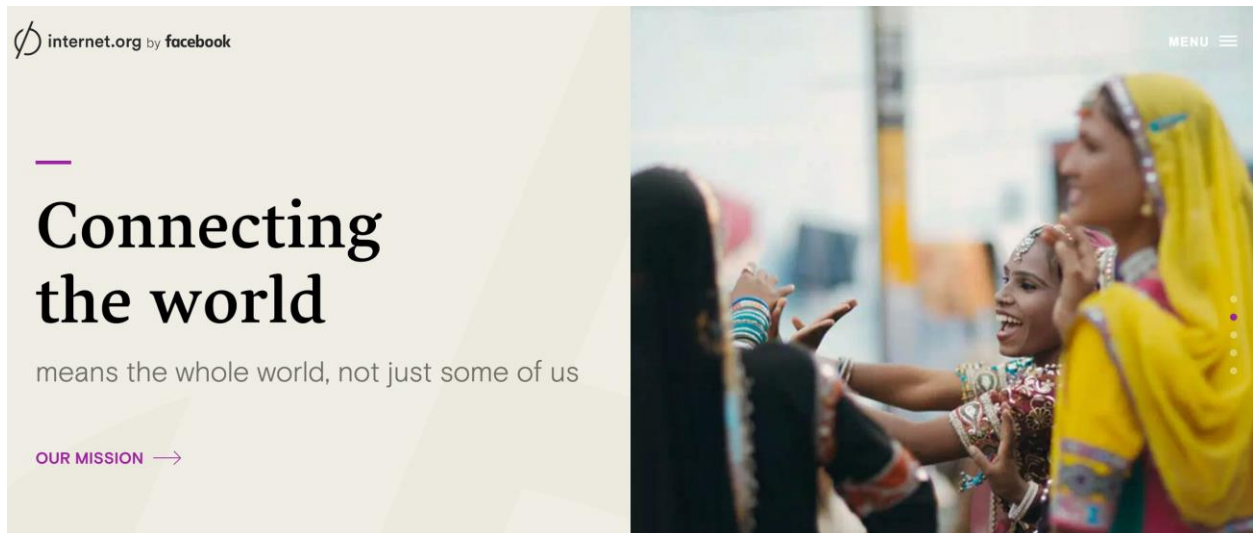


Figure 2. Screenshot of Project Loon website (<https://www.solveforx.com/loon/>)



Similar ambitions are present in projects by international development organisations. For example, the African Development Bank (AfDB) cites US\$55 billion pledged in its Connect Africa initiative, which consists mainly of Internet infrastructure investments such as submarine and backbone fibre projects (African Development Bank Group, 2016). Similarly, the World Bank has put about US\$1.2 billion into broadband infrastructure projects such as the Central African fibre backbone network and the East African EASSy cable (Navas-Sabater, 2015).

Myriad projects on the local level within African countries have been driven by similar ambitions. For instance, Project Isizwe aims to connect all South Africans to Wi-Fi hotspots in public and communal spaces, to ultimately tackle the country's stark inequalities (Project Isizwe, 2015). Earlier well-published examples in the education sector include the 'One Laptop per Child' project or the Kenyan 'Laptops for Schools' project.

A coalition of powerful interests is clearly striving to achieve positive development outcomes by providing connectivity to the disconnected (see Smart et. al. (2016) for a review of the range of visions of what those organisations actually mean by 'connectivity'). The rationales vary from assertions about positive effects of Internet connectivity on socio-economic development to sweeping normative statements that Internet is 'A Human Right' and 'essential to achieve humanity's global goals' (Connect The World, 2016). The actors that drive this agenda appear to be economic development organisations, governments, foundations, non-governmental organisations, and Internet and technology companies.

THE AVAILABLE EVIDENCE

These ambitious visions about increasing connectivity led us to review empirical evidence, from a range of disciplines, on the impacts of the Internet. We queried ProQuest, SCOPUS and Web of Science scholarly databases for peer-reviewed contributions that include at least one connectivity-related keyword (Internet, broadband, ICT, and connectivity) and a search term for relevant types of impact (growth or economic development, productivity, employment or job, and inequality) in its title or abstract. We then reviewed the fifty most relevant results, as determined by the databases' relevance ranking. Where the papers referred to other closely related research, these additional articles were considered as well.

A pattern emerging from the review is that the evidence base is inconclusive: there is evidence that confirms both positive and negative effects of connectivity. Other trends include variegated effects across different contexts (e.g., low-income vs. high-income countries or rural vs. urban), and that much more is known about high-income countries than for middle- or low-income countries.

Many econometric studies have been conducted at the cross-country level. For instance, usage and penetration rates of ICTs (such as personal computers, mobile phones and Internet) were found to be positively related to growth (Sassi & Goaied, 2013; Vu, 2011). Similarly, investment in ICTs and telecommunication or broadband infrastructure were shown to be positively related to growth in OECD countries (Koutroumpis, 2009; Röller & Waverman, 2001). Municipal level studies in the United States and national-level studies in other Western countries and China find similar results (Ford & Koutsky, 2005; Kumar, Stauvermann, & Samitas, 2016; Oulton, 2002).

Yet evidence to the contrary also exists, especially for lower-income contexts. Several studies examining the impact of ICT investments on growth across country income levels find either no effect for any income bracket (Pohjola, 2002) or positive effects only for high-income countries but not for lower-middle income or developing countries¹ (Dewan & Kraemer, 2000; Lee, Gholami, & Tong, 2005; Yousefi, 2011). For microenterprises in rural Botswana, Duncombe and Heeks (2002) find that ICT-based information systems are less useful than informal information systems for meeting local information needs.

For employment, studies at the national and sub-national level find positive effects for investments in telecommunications and broadband infrastructure and for broadband penetration in Western countries (e.g., Atasoy, 2013; Katz, 2009). However, for Korea, Ju (2014) finds that ICT technology adaptation has both negative and positive effects on employment depending on sectors and skill levels in the labour force. Studying Iran, Rasoulinezhad and Nouri (2010) find that ICTs have a negative effect on employment in the short run, but positive effects in the long run.

Investment in telecommunications networks and services are also found to increase productivity in both developed and developing countries (Seo, Lee, & Oh, 2009; Thompson & Garbacz, 2007). At the firm-level, ICT access and usage have been found to have a positive relation on productivity in countries around the globe, including in Africa (Esselaar, Stork, Ndiwalana, &

¹ We use the developing vs. developed country dichotomy only when relating the content of a source. Cf. Peet and Hartwick (2009) who problematize the terminology.

Deen-Swararray, 2007; Kumar et al., 2016; Paunov & Rollo, 2015). However, other studies using ICT capital stock as an independent variable find a lower positive effect in developing countries compared to developed ones (Papaioannou & Dimelis, 2007). Yet other studies find no positive effects for ICT investments or broadband adoption (Haller & Lyons, 2015; Pohjola, 2002).

Concerning inequality, prior research shows no clear trend, finding that the effects of ICTs or the Internet interdepend with skill levels (Alderete, 2011), age and usage patterns (Ihm & Hsieh, 2015), initial class disadvantages (Angus, Snyder, & Sutherland-Smith, 2004), and myriad other factors (Gilbert, 2010). Variation even exists within poor populations: telecommunication services have been found to lessen the financial vulnerability and susceptibility to shocks of poor households in South Africa, but the poorest households might not benefit to the same extent (Skuse & Cousins, 2007). ICTs have also been found to be insufficient to tackle gender inequality in Sub-Saharan Africa (Humer, 2011) and ICT tools in Indian e-governance have been seen to exacerbate exclusionary practices (Martinez, Pfeffer, & Dijk, 2011).

The examples presented highlight that the evidence on growth-enhancing and inequality-reducing impacts of connectivity is inconclusive, especially for low-income contexts. Most evidently, the academic literature has little to offer in support of claims that the Internet causes widespread and inclusive economic impact, thereby tackling inequality.

METHODOLOGY

The paper uses a discourse analysis, following Rose (2012). In the process, we identify discursive formations (connections between systems of meaning) and intertextuality (the interdependence and mutual contextualization between different discourses). The method is geared towards detecting authoritative accounts with productive power, where ‘productivity’ denotes the potential of discourses to discipline and structure actors’ thoughts, goals, actions and identities. The sampling thus began by establishing a list of powerful organisations which were likely to make claims regarding the impact of connectivity on development in Africa. ICT policy documents published by African governments represented an immediately relevant group of sources. In addition, we sampled documents from large and influential international organisations with a stake in the impact of connectivity.

ICT Policies of African Governments as Sources of Discourses

Nearly all countries of Sub-Saharan Africa have developed ICT policies over the past two decades; the 48 available policies thus represented the initial sampling frame. The frame included all African countries with ICT policies in English. We then chose a purposeful sample of seven policies, aiming for the greatest possible expected diversity in discourses (see Table 1). Each policy is the first ICT policy of any given country, and remains in effect as well as the most updated version at the time of writing. The final sources are the national ICT policies of Ghana (2003), Kenya (2006), Lesotho (2005), Mozambique (2000), Namibia (2008), Nigeria (2012), and Tanzania (2003).

Table 1. ICT policies analysed, GDP and mobile broadband subscriptions of countries

Country	Policy title	Year	Mobile-	GDP
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		publis hed	Broadband Subscription (per 100 people) 2014*	per capita (current US\$) 2014*
Ghana	Ghana ICT for Accelerated Development (ICT4AD) Policy	2003	59.8	1,442
Kenya	National Information and Communications (ICT) Policy	2006	9.1	1,358
Lesotho	ICT Policy for Lesotho	2005	32.8	1,034
Mozambique	Information and Communication Technology Policy	2000	3.0	586
Namibia	Information Technology Policy for the Republic of Namibia	2008	35.5	5,408
Nigeria	National Information and Communication Technology (ICT) Policy	2012	11.7	3,203
Tanzania	National Information and Communications Technologies Policy	2003	3.0	955

Note: In the text, the paper refers to each document using the shorthand “[Country name] ICT Policy”

* Source: ITU and World Bank Development Indicators

Reports by International Organizations as Sources of Discourses

The sampling of reports by international organisations started with a deliberately broad scope to avoid missing important elements of discursive formations and to be able to pay attention to intertextuality (Rose, 2012). Accordingly, organisations were identified that might advance discourses on the impact of connectivity; specifically: bilateral development organisations, international development organisations, consultancies, global philanthropic organisations, technology-focused international organisations, corporations, and others. This yielded a total of twenty-seven organisations.

It was deemed highly unlikely that codified sources of productive discourse would not be available online. Thus, for each organisation, a systematic keyword-based online search was conducted from March to May 2015, using combinations of the organisations’ names, keywords for impact (‘impact’, ‘effects’, ‘outcomes’) and keywords relating to connectivity (‘connectivity’, ‘Internet’, ‘ICT’, ‘technology’, ‘mobile’). Only reports were considered, while more informal resources such as position and working papers, blog posts or brochures were excluded. This yielded a list of 47 reports.

From all reports, a purposive sample was drawn, according to a given report’s relevance for the research question. Those reports were deemed relevant which (1) made direct claims and statements about the impact of connectivity on development, (2) focused specifically on connectivity or the Internet rather than on mobile technology, other technologies, or ICTs in general, (3) had Africa or an African country as their specific geographical scope, and (4) are published by an influential, large, or widely recognized organisation. When a given organisation had published multiple relevant reports, only the most relevant report was considered. Ultimately, thirteen reports were analysed (see Table 2).

Table 2. List of reports analysed in order of relevance to research question

Organization	Report title	Year published	Shorthand in paper
McKinsey Global Institute, McKinsey & Company	Lions Go Digital: The Internet's transformative potential in Africa	2014	McKinsey
The World Bank	Economic Impacts of Broadband (in: IC4D 2009: Extending Reach and Increasing Impact)	2009	World Bank (2009)
Deloitte for Facebook on behalf of Internet.org	Value of Connectivity	2014	Deloitte & Facebook/Internet.org
Dalberg	Impact of the Internet in Africa: Establishing conditions for success and catalysing inclusive growth in Ghana, Kenya, Nigeria and Senegal	2013	Dalberg
African Development Bank (AfDB)	Connecting Africa: An Assessment of Progress Towards the Connect Africa Summit Goals	2013	AfDB
World Economic Forum (WEF), Cisco Systems	Ch 1.2. ICTs, Income Inequality, and Ensuring Inclusive Growth, in Global Information Technology Report: ICTs for Inclusive Growth (in: Global Information Technology Report 2015)	2015	WEF & Cisco
Dalberg, supported by Rockefeller Foundation	Digital Jobs in Africa: Catalyzing Inclusive Opportunities for Youth	2013	Dalberg & Rockefeller
GSMA Intelligence	The Mobile Economy of Sub-Saharan Africa 2014	2014	GSMA
ITU (UN), Broadband Commission	State of Broadband 2014: broadband for all	2014	ITU
Boston Consulting Group, commissioned by Qualcomm	The Mobile Revolution: How Mobile Technologies Drive a Trillion-Dollar Impact	2015	BCG & Qualcomm
Internet Society	Internet Society Global Internet Report 2014: Open and Sustainable Access for All	2014	Internet Society
World Wide Web Foundation	Web Index Report 2014/2015: The Web & Growing Inequality	2014	WWW Foundation
Ericsson in collaboration with Arthur D. Little & Chalmers University of Technology	Socioeconomic Effects of Broadband Speed	2013	Ericsson

Coding and Analysis

An initial coding scheme was developed that could capture claims and assumptions about the (causal) impact relationship between connectivity and development. The coding scheme captured whether the impact was deemed to be positive or negative, the directness of the statement, and mentions of uneven impacts and contingencies. The scheme also covered broader discursive imagery ('transformation' or 'acceleration'), the types of evidence referred to, and the methodology or approach that the sources used to establish their claims. Towards the end of the coding process, the coding scheme stabilised, which was interpreted as a sign of saturation (Strauss & Corbin, 1990).

FINDINGS: DISCOURSES ON THE EFFECTS OF CHANGING CONNECTIVITY

The Visions of African Governments

Three major groups of discourses were derived from the analysis of African national ICT policy documents. The first group makes the claim that connectivity positively impacts economic growth and development. The second group holds that connectivity can alleviate digital divides and marginalisation, while it does not make claims directly about inequality. A third group portrays the existence of local challenges that need to be overcome by policy to enable greater positive outcomes of connectivity.

Connectivity Increases Growth or Development

All policies make explicit claims that increasing connectivity (particularly through the implementation of the ICT policy) leads to economic growth and other types of development impacts. These statements tend to paint a picture of ultimately large impacts and do not refer to evidence. For instance, the Lesotho ICT policy posits: 'ICTs can have a wizard effect on speeding the development process of a country' (p. 13).

However, there is variation in the causal immediacy and strength that the policies assumed. While the effect is depicted as direct and sweeping in a handful of policies, most of the policies describe an indirect effect: connectivity is seen to facilitate ongoing economic processes (e.g., through increasing efficiency and productivity) or enable new economic processes in the information and knowledge-based economy (e.g., through innovation in the ICT sector). These impacts are expected to be generated both through a growing ICT sector and adoption of ICTs in other sectors.

The rapid advancements in the field of Information Technology (IT) and the resultant explosive growth of the information services sector have radically changed the world's economic and social landscape... This has further resulted in new avenues of development, employment, productivity, efficiency, and enhanced economic growth. (Kenyan policy, p. 9)

Some policies explicate other mechanisms related to flows of information, the exchange of knowledge and new opportunities for learning and interaction. Such claims often speak to the public sector and public service provision.

[T]he Internet... has impacted the way business is conducted, facilitated learning and knowledge sharing, generated global information flows, empowered citizens and communities in ways that have redefined governance, and have created significant wealth and economic growth resulting in a global information society. (Tanzanian policy, p. 1)

It is... widely acknowledged that broadband infrastructure is an enabler for economic and social growth in the digital economy. Broadband has the potential of enabling entire new industries, and introducing significant efficiencies into education delivery, health care provision, energy management, public safety, government/citizen interaction, and the overall organisation and dissemination of knowledge, and distribution of wealth. (Nigerian policy, p. 29)

Broad economic and growth impacts are often discussed as a global and self-evident phenomenon brought about by developments in digital technology and ICT infrastructure. The underlying rationale appears to be that, by adopting ICTs, a country would be able to transform into an information and knowledge-rich economy and *thereby* reach higher levels of development. This proposition exists in parts of all of the sample policies.

Sustainable social and economic development in today's Information Age is contingent upon each citizen's ability to access, process and create information. In times past, we searched for gold, precious stones, minerals and ore. Today, it is knowledge that makes us rich and access to information is all-powerful in enabling individual and collective success. (Lesotho policy, p. 12)

The policies argue that increasing flows of information have meant that countries have developed into 'information societies' which compete in a global knowledge economy. This is seen to be the result of worldwide digital transformations or the beginning of an information age. Each of the policies positions the country's given situation against this backdrop, arguing that participation in a globally integrated information or knowledge economy will produce growth and development faster than other types of economic activity.

[T]hose nations... involved in the development as well as the selling of information... knowledge... and technology... are moving faster on the socio-economic development scale compared to others. There is no doubt that in the new emerging economic order, the fundamental basis for wealth creation and national prosperity are information and knowledge, and that, Ghana cannot afford to be without either of these. (Ghanaian policy, p. 14)

Based on such an understanding of economic transformation and global competition, policies express a sense of both opportunity and pressure to integrate with and compete within a global knowledge economy.

There is no doubt that for Ghana to compete and prosper in the new emerging global economy; which will be dominated by information and knowledge-based economies, she will need to embrace and harness ICTs to facilitate her development process. (Ghanaian policy, p. 14)

Mozambique cannot remain on the edge of this world revolution. The government has therefore adopted an Informatics Policy, which it intends will... raise Mozambique to the level of a fitting and competitive partner in the Global Information Society. (Mozambican policy p.1)

The policies state their claims either as self-evident truths, as passive truths without specifying a source ('it has been acknowledged'), or as based on unspecified evidence ('evidence shows'). Not a single case was found where specific evidence, such as a published study or paper, was cited.

The majority of the policies also mention job creation as an effect of ICTs and a contributor to the nation's growth. However, the ways in which employment is assumed to be created vary more widely. The Nigerian policy claims that many countries have transformed their ICT sectors to support job creation in the local software economy (p. 37) and in other sectors of the economy (p. 2). Similarly, the Kenyan policy states that the digital economy offers new avenues of employment for citizens (p. 10), and the Tanzanian policy highlights that current demand for IT professionals far outweighs supply (p. 5). In turn, the Ghanaian and Namibian policies argue that increasing the competitiveness and value added of the ICT sector will result in new jobs and contribute to growth (p. 47 and p. 1, respectively). The Lesotho policy uses more general terms, suggesting that 'wide availability of information regarding social services, job creation and education will provide the foundation for individual empowerment, national unity and a stimulus for a thriving economy' (p. 12).

One of the underlying assumptions is that ICT-induced efficiency and productivity increase employment rather than making existing jobs redundant. The Nigerian policy seems to further assume that jobs in the local IT industry are sustainable (while no other policies mention the sustainability of the sector). The policy passages addressing employment do not refer to explicit evidence, but sometimes loosely mention other countries' experiences. Most of the claims are instead presented as uncontested facts.

Connectivity Reduces Digital Divides and Marginalisation

The analysed policy documents do not usually discuss the relationship between connectivity and inequality explicitly, but under the theme of the 'digital divide'. The policies identify marginalisation of groups by gender, age, disability or location as sources of digital divides. To alleviate digital divides, the policies tend to call for an increase in access to connectivity and ICTs for marginalised populations, based on the expectation that access opens up economic, social and political opportunities.

ICTs can provide a powerful means for reaching out to youth and women and including them in the development process. Access to ICTs can have an

empowering effect on youth and women through the acquisition of new skills and exposure to opportunities. (Lesotho policy, p. 46)

It is worth noting that not a single policy cautions against connectivity potentially deepening inequality and existing digital divides. Moreover, the policy passages do not refer to any explicit evidence, instead stating causal relations as self-evident.

The majority of the policies also discuss inequality specifically in terms of gender. While offering somewhat different angles, all policies assume that through ICTs, women are able to access information and are afforded means to participate in the economy, society, and politics. The Ghanaian and Kenyan policies specifically call for the use of ICTs as an empowerment tool and to close the gender gap in education, employment, and decision-making (p. 9 and p. 9, respectively). The Lesotho policy suggests that women might acquire new skills and opportunities through ICTs (p. 13), and that ICTs offer a powerful means for reaching out to women and involving them in the development process (p. 47). Similarly, the Tanzanian policy posits that through providing opportunities for learning and ICT access, ICTs can be used to address societal inequities related to women (p. 14).

Overcoming Local Challenges to Reap the Full Impact of Connectivity

To varying extents, the sample policies relate their goals to obstacles in local economic, social and political contexts. While all policies describe the economic development-inducing and inequality-reducing effects of connectivity enthusiastically, some contextualize these aspirations with more cautionary descriptions of domestic challenges that must be overcome for policy goals to be reached.

The current Tanzania ICT situation requires urgent steps to enable Tanzanians to participate meaningfully in the knowledge economy, recognising that Tanzania has low levels of human capital development, local content creation, ICT infrastructure and access, which together lead to high costs of participation. (Tanzanian policy, p. 1)

Where policies address the relationship between connectivity and inequality, the discussion is usually framed around closing the digital divide or urban-rural divide. The Ghanaian, Lesotho, and Nigerian policies address local challenges with more nuance, while other policies touch upon such limitations in less detail. Most of the policies agree that low capacity and skills among potential users of ICTs, lacking basic education, insufficient infrastructure and underdeveloped policy and regulatory frameworks pose the most formidable barriers in the way of policy goals.

In discussing these obstacles, none of the policies present domestic data to trace the steps that the country has taken or could be taking towards realising the proposed benefits of the internet. The policies also do not tend to devise strategies for overcoming them. Instead, the ICT policy is situated within the wider framework of the social and developmental policies of the country aimed at addressing the developmental challenges. Policies also seem to assume that, if challenges related to capacities and ICT access are met, connectivity will improve the domestic technology sector which catalyses other domestic industries and enters the global marketplace as a viable competitor.

The Visions of International Organizations

Connectivity Has a Transformative Impact on Growth and Development

Every reviewed report published by international organisations claims that the Internet has an overwhelmingly positive effect on social and economic development. This overarching claim is widespread and diverse, expressed through several sub-discourses and rationales. Overall, claims and rationales are similar to the ones presented for African ICT policies. However, the reports are less likely than the policy documents to use the idea that African nations would ascend into, or effectively compete in, a globally integrated knowledge economy.

Often, the claims are general and sweeping in nature, using language of authority and self-evidence, or drawing on vivid metaphors. Key images in this context are ‘transformation’, ‘revolution’, ‘force’, ‘acceleration’, ‘engine’, or ‘catalyst’.

The Internet is a tremendous, undisputed force for economic growth and social change. (Dalberg, p. 7)

The Internet has changed the world. Open access to the Internet has revolutionized the way individuals communicate and collaborate, entrepreneurs and corporations conduct business, and governments and citizens interact. (Internet Society, p. 8)

All reports mention economic growth as an important part of the Internet’s positive developmental impact.

Globally, mobile technology has emerged as a primary engine of economic growth, stimulating enormous private-sector spending in both R&D and infrastructure, and profoundly changing daily lives— everywhere. (BCG & Qualcomm, p. 3)

Several reports state numeric values for connectivity’s impact on GDP in African countries, either deriving these values within the report or citing other sources. Reports which derive a value (BCG & Qualcomm, GSMA and McKinsey) calculate the economic output of segments within a country’s ICT sector as a share of the country’s total GDP. Even though these are simple descriptive measures, which by themselves do not allow conclusions about causality, the results are usually couched in unspecific language around ‘contribution’ and ‘impact’. Thereby, the calculations are framed as evidence for a directed positive effect of connectivity on economic development. The reports also claim that the Internet increases employment.

In 2013, the mobile industry contributed 5.4% to overall gross domestic product (GDP) in the region, and this is forecast to increase to 6.2% by 2020. (GSMA, p. 3)

Several other reports (Dalberg & Rockefeller, Dalberg, WEF & Cisco) cite World Bank (2009), which is considered a ‘landmark study’ (WEF & Cisco, p. 32). World Bank (2009) measures

‘contribution’ of mobile phone and broadband penetration to GDP not as a ratio, but through a regression using historic macroeconomic data. Interestingly, the study authors themselves as well as subsequent critics (Katz, 2012; Kenny & Kenny, 2011) point to severe limitations to this approach; yet this is not acknowledged in any of the reports that cite it.

Reports detail potential causal chains of Internet impact by discussing either improvements in existing processes of value creation (productivity, efficiency, reductions in cost, etc.) or the creation of new value (consumer surplus, innovation, opening new markets, etc.). Underlying this appears to be an assumption that the Internet seamlessly enables remote interaction. Economic and utility gains are attributed to increased interpersonal communication, distance bridging in the coordination of work (e.g., virtual teams, telecommuting, and outsourcing), and augmented learning and knowledge creation.

Throughout the developing world, the Internet is connecting remote populations to markets and strengthening the overall efficiency of service delivery in areas such as health, education, livelihoods and financial inclusion, as well as creating access to government services for the most marginalised populations. (Dalberg, p. 7)

The Internet plays a pivotal role in extending access to educational resources and in accelerating knowledge sharing... As a result of education improvement young people are more employable... Improved literacy promotes social inclusion and benefits the economy... (Deloitte & Facebook/Internet.org, p. 5)

Connectivity Levels the Economic Playing Field

A second major body of discourse concerns the Internet’s role as a force that levels the economic playing field. Similar to the policy documents, the reports rarely confront economic inequality explicitly. Notwithstanding, all reports see the Internet as alleviating poverty, or they discuss the Internet’s potential to achieve inclusion by reaching marginalised and rural populations. A difference to the policy documents is that the notion of a ‘digital divide’ is not as widespread. Instead consultancies use more positive language such as ‘inclusive growth’ (WEF & Cisco) or ‘digital inclusion’ (GSMA).

Reports that argue that the Internet alleviates poverty promote the idea of untapped potential and the possibility for developing countries catching up with developed ones. Discourses around ‘inclusion’ either use this term as a broader aspirational image, or argue more specifically that the Internet is a viable tool to target populations which have previously been excluded or marginalised, in particular the rural poor.

Expanded access to information, increased business and job opportunities, and ultimately higher incomes are all factors that can combine to eradicate extreme poverty. Deloitte estimates that extending Internet access in developing economies [can lift] 160 million people out of extreme poverty in the regions covered by this study. (Deloitte & Facebook/Internet.org, p. 4)

ICT enables businesses to engage in a cost-effective manner with those that are socially and economically marginalised, whether as consumers, suppliers, distributors, or employees. (Dalberg & Rockefeller, p. 2)

Discussions explicitly addressing the role of the Internet for economic inequality can be found in two more recent reports (WWW Foundation, WEF & Cisco). WWW Foundation makes sweeping, broad-strokes claims about the Internet's potential to be a counter force to inequality.

Today, armed with little more than a smartphone, anyone — regardless of where they were born or how much they earn — can start a business, record a music video, crowdfund an invention, take courses with Nobel Prize-winning professors, or even launch a successful campaign for office. (WWW Foundation, p. 4)

Interestingly, the Internet's 'critical contributions... to fighting inequality' (WWW Foundation, p. 4) identified in the report are identical to mechanisms that other reports mention in the context of the Internet's role as a contributor to growth (see above), such as '[e]xpanding access to knowledge, information and skills' or 'lowering barriers for small and micro enterprise to innovate, compete and succeed' (p. 4). Somewhat paradoxically, the report also quotes sources which show that Internet technology is *increasing* income inequality, but then argues that the Internet has *potential* to do the opposite.

WEF & Cisco make a different, macroeconomic argument to arrive at the same conclusion: that the Internet tackles inequality. The report asserts that the Internet contributes to growth, then links growth to poverty reduction, and then concludes that ICTs decrease inequality.

[T]he impact of ICTs on income growth and poverty alleviation are (sic) undeniable, and greater adoption of ICTs in lower-income groups will accelerate income gains at the base of the economic pyramid. (WEF & Cisco, p. 32)

The authors seek to support these argumentative connections by presenting correlations between macroeconomic indicators. WEF & Cisco argue that, in the 20th century, ICT use has increased, poverty has decreased, and well-being and ICT use are highly correlated. Consequently, the authors dismiss the Solow paradox (Solow, 1987) and misquote Daron Acemoglu, a prominent contemporary researcher of the topic,² presenting him as a supporter of their argument.

² Specifically, WEF & Cisco cite Acemoglu in the following way: 'Acemoglu notes that "technology is far from the only reason why the preponderance of wealth created in recent decades has accrued to households at the top end of the economic spectrum,"³¹ and identifies many interrelated factors such as the decline of unions, changes in tax structures, and globalization.' (p. 34). However, in the source (a Salon blog post available at http://www.salon.com/2013/07/19/the_Internets_greatest_disruptive_innovation_inequality/), Acemoglu is cited by a journalist to have made a rather opposite statement: "I think very few people would deny that technology has played a really important role in growing inequality," says... Daron Acemoglu... "There are many interrelated factors at play, including the decline of unions, changes in tax structure

Ultimately, the authors state that ‘many of the benefits of ICTs are not accruing to lower-income populations because access and adoption are low’ (p. 35) and ‘posit’ (p. 32) that ICTs will lower inequality as they spread.

In sum, most reports connect the Internet’s reach to an assertion that it provides opportunity, reduces poverty and increases economic and societal inclusion. Few reports make explicit claims about the Internet’s role for inequality, but if they do, they arrive at the conclusion that the Internet reduces inequality.

Connectivity Has Untapped Potential to Deliver Even More Economic Development

A third group of discourses concerns calls for action. The basic assertion is that while the Internet’s impact is already large, it could be even larger if some enabling action was taken. Accordingly, the ‘story of the Internet in developing countries is very much a work in progress’ (Dalberg, p. 7).

This journey is just beginning... But the lions are now stirring.... If governments and the private sector continue to build the right foundations, the Internet could transform sectors as diverse as agriculture, retail, and health care— and contribute as much as \$300 billion a year to Africa’s GDP by 2025. (McKinsey, preface)

The assumption of untapped potential often leads into generic claims that governments and the private sector are presented with ‘opportunities’, and that they need to ‘lay foundations’ and create an ‘enabling environment’ for the Internet to flourish. The relationship between the private sector and the government is typically understood to be one of complementation and partnership.

More still needs to be done, of course, but the continuing partnership and investment of governments, international organisations, development banks and multinational companies brings considerable hope for the future. (AfDB, p. 7)

Interestingly, some of these claims imply an inverse causal relationship between connectivity and economic development. Specifically, WWW Foundation argues that due to poverty, the Internet cannot unfold its potential, so that policymakers should tackle poverty *in order to* increase Internet use. GSMA at one point makes the same assumption, and concludes that subsidies like universal access funds will be needed to allow mobile operators to recuperate infrastructure investments. In these cases, connectivity has apparently become the end goal and poverty alleviation the means to achieve it.

In sum, African governments and international organisations assume that the impacts of connectivity on economic development are positive and transformative. These institutions are convinced that this relationship is causal and undisputed. They are less adamant about the impact

dating back to the 1980s and globalization... But the middle is collapsing. It’s just too easy to replace human labor with computer-driven automation.””

of connectivity on inequality, but whenever this relationship is discussed, the Internet is presented as a tool to counter inequality. The reviewed documents introduce some causal chains underlying the relationship, such as the creation of efficiencies and productivity. The documents also argue that the Internet would have even greater positive impact if policymakers and other actors took more action to enable it.

DISCUSSION AND CONCLUSION

What Lies Beneath Grand Visions of Connectivity?

We showed that governments and international organisations nurture *Grand Visions* about the potentials of changing connectivity in African economies. ICTs and the Internet are envisioned to speed up the economic development of countries, level the playing field, bridge previous structural and infrastructural deficiencies, increase productivity and employment, and include previously marginalised groups such as women, youth, and the rural poor in the spoils of development. Why are there such fantastic visions about the transformative power of connectivity?

One reason could be that future aspirations are founded in well-documented, transformative effects that technologies of connectivity have had in the past (c.f. Graham, Andersen, & Mann, 2015). However, our review of the evidence suggests that the Internet and other ICTs have not had any undisputed transformational impact on economic development. Instead, the evidence is inconclusive, and positive impacts appear to be idiosyncratic, contingent and variegated. The available evidence base is also inconclusive with regard to connectivity's role for inequality, and there is even indication that connectivity can exacerbate, rather than limit, existing inequalities.

Indeed, the way in which the sources we analysed referred to evidence appears to be highly biased towards a foregone conclusion of a strong positive impact: either claims were considered self-evident so that no evidence was cited, or claims were based on crude macro-economic assessments and positive anecdotes. Negative consequences, risks and the possibility of no or limited impact were ignored almost entirely.

It was also revealing to see which types of publications were referred to as evidence in reports by international organisations. Reports from consultancies, industry associations, and other international organisations (such as the World Bank, Deloitte or McKinsey) were the most prevalent among referenced sources.

Academic, peer-reviewed and methodologically rigorous studies were only cited in the analysed content of three documents (out of a total twenty that were analysed), mainly in World Bank (2009) and WEF & Cisco. Upon closer examination, even these studies proved to be heavily biased in favour of the conclusion that connectivity would have positive effects. The reports often cited potential causal impact chains rather than empirically shown ones, over-generalised results from specific cases, or even misquoted sources.³ It is a striking finding for us how

³ In support of this claim, a detailed comparison of how academic content was referenced in the two reports versus what the cited sources actually say can be obtained from the authors upon request.

assertive the authors of World Bank (2009) and WEF & Cisco are in making sweeping claims, even if it is apparent that their own review of evidence did not yield much in support.

In fact, in a striking reversal in tone and message, the World Bank recently admitted that the Internet does not generate positive development impact everywhere and for everyone in the same way. In its flagship publication, the World Development Report (Deichmann & Mishra, 2016), the Bank acknowledged that the impact of the Internet is geographically variegated, which has led to divides between “digital haves and have-nots.” The report even implicitly invalidates the methodology of World Bank (2009), maintaining that “[c]ross country regressions are not an appropriate tool to draw inference on the impact of ICT on growth” (Deichmann & Mishra, 2016, p. 56). It appears that such confessions came as a result of the World Development Report’s extensive review process, during which hundreds of practitioners and academics have been consulted (Deichmann & Mishra, 2016, pp. xv–xvii), ultimately leading to a more grounded and realistic outlook. It is our hope that similarly nuanced and balanced appraisals will become the norm in practitioner and policy debates; yet, it remains to be seen if the widespread discourses outlined in this paper will shift as a result of one report.

It remains that, at this point in time, it is evident that our knowledge base is far from sufficient to justify Grand Visions. Probing further, we examined patterns of assumptions and rationales that were underlying the claims in the discourses.

First, especially discourses found in policy documents rest on an assumption that greater access to ICTs will allow a ‘knowledge economy’ to be joined. Here the ‘knowledge economy’ is the outcome of a process of economic transformation: countries move from value creation in primary sectors rooted in informal modes of exchange to value creation through processing knowledge and information aided by technology.

Second, optimistic technological determinism is clearly undergirding much of what is said. Much like in popular contemporary ICT for development debates (Toyama, 2015), the discourses analysed in this paper assume that all positive developmental outcomes come from an open and accessible Internet, while negative outcomes arise through (in)action that stymies the potential of the Internet. Disappointing outcomes or slow progress are explained by socio-economic, cultural, or regulatory factors. This assumption leads to a somewhat paradoxical line of argumentation: while the Internet itself is an undeniable and overwhelming force for good, it is still said to need enabling by a range of actors (policymakers, firms, development organisations). In any case, the introduction of a technological fix is seen to be able to precipitate significant positive change.

Third, claims are made not only in separation from any sort of rich evidence base, they also glance over historical and geographic contexts through which the effects of ICTs might be filtered into real but variable outcomes. Mirroring older modernist visions of development (cf., Rostow, 1990), ICTs are assumed to have highly similar effects irrespective of context. While local implementation challenges are often listed, African ICT policies have strikingly uniform goals and objectives, similar both in relation to each other and in their motivation to replicate the presumed ICT-related successes of countries in the Global North or ‘the world’. It appears that Grand Visions are uniform even though the existing evidence clearly suggests that the real impacts of connectivity are anything but.

Fourth, while plans and policies address inequality, they have little—specifically—to say about how changing connectivity might help narrow the gap between rich and poor; how it could benefit the poor *more than* the rich. Instead, they follow the rationale that the Internet's inclusive *potential* (distance bridging, openness) and the economic growth assumed to arise from the spread of connectivity technology would lead to greater benefits for the poor and marginalised than for unspecified others. A comparison of relative gains along socio-economic strata—that is, an assessment of inequality effects—is never made. With evidence pointing out that connectivity might well amplify inequalities (Autor, Katz, and Kearney 2008; Bénabou 2005; Aghion, Howitt, and Violante 2002), this is a curious and potentially dangerous oversight.

Fifth, plans and policies rarely ask who else might benefit from efforts to connect more disconnected actors other than the traditional subjects of development: the poor within low-income countries. For instance, it has been established that management consultancies skilfully create productive discourses which ultimately induce their clients to provide them with more business (Froud, Haslam, Johal, & Williams, 2000; Sorge & Witteloostuijn, 2004). Most of the creators of discourses analysed in this paper have a vested interest in perpetuating Grand Visions, as the widespread acceptance of these visions ultimately means more clients, more funding or increased legitimacy.

Real Consequences, Real Risks of Grand Visions

Development has always grappled with why some people and places have much more than others. Yet much of that conversation is lost within contemporary discourses of ICTs and development. As states and organisations rush to develop policies and plans to build drones and balloons, lay fibre-optic cables, and find other ways to connect the disconnected, much is said about the power of ICTs to positively transform the world's most underprivileged people and places. Yet, we have shown that the evidence base to support such claims is thin. More worryingly, once we see the techno-determinist and modernist assumptions at the core of many visions, visions of rapid development precipitated though ICTs might not just fail to achieve their goals (even on their own terms), they could actively undermine those very efforts in a world of scarce resources.

This is because 'self-evident' discourses of connectivity, like modernist visions before them offer a powerful, aspatial and ahistorical teleology (Graham et al., 2015). This allows policymakers to point to new technological fixes instead of focusing on how the political economy of any given context works to allocate power and wealth.

Visions and aspirations of transformation through connectivity are thereby able to drive concrete government projects and development funding. Hardly any dependable aggregate figures of funding and subsidies are available; many development actors are not accountable to tax payers (such as philanthropic organisations) and thus do not disclose their spending. Heeks (2009) uses official development assistance data as a proxy and concludes that 'hundreds of millions of US dollars per year are invested in [ICT for development] projects; and that tens of billions of US dollars per year are invested in... infrastructure.' The World Bank, as an example of a large development organisation, spent US\$4.2 billion for ICT programming from 2003 to 2010

(Independent Evaluation Group, 2011), and is currently investing about US\$1.2 billion in grants and loans for regional connectivity infrastructure programmes in Africa (Navas-Sabater, 2015). Rockefeller's digital jobs programme, as an example of an initiative without infrastructure investments, provides US\$100 million across Africa. Irrespective of how we measure the specifics, it is clear that huge sums have been, and continue to be, invested in the area.

Admittedly, it is impossible to establish a direct, causal connection between the discourses we have outlined and the myriad decisions that go into such 'digital development' spending. Still, our analysis highlights the ubiquity and assertiveness of discourses that are optimistic about the impacts and potentials of connectivity. It is clear that the productive power of these discourses provides a fertile ground for the argumentation of actors seeking to set up connectivity infrastructure, run Internet-related development projects, or sell equipment and services connected to the agenda (see (Graham, 2015) for an example of how Kenyan ICT firms strategically deploy visions of changing connectivity). As just one example, in a recent presentation, the World Bank summarized the rationale for investments in a fibre network in Central Asia in unequivocal terms: 'Improved Internet connectivity = Economic benefits' (Navas-Sabater, 2015, p. 4). Such a simple rationale can only be credible if the audience is sufficiently credulous, and this credulity is what discourse produces.

Discourses of development have always produced and reproduced the very objects of their 'concern' (Escobar, 1995). We can take a lead from Ferguson's (1994) prompt to ask 'what do aid programmes do besides fail to help poor people?' Our worry here is not just that the significant resources invested in connecting Africa's disconnected will be wasted. It is rather that the Grand Visions of connectivity will themselves lead to an exacerbation of the very things that they purport to solve. For instance, by framing inequality as something that can be effectively tackled with more connectivity, we might take away focus from the structural economic processes bringing about *widening* inequalities. What is worse than a developmental intervention not working is believing that an important issue has been effectively addressed when it, in reality, clearly hasn't.

It is possible that contemporary Grand Visions of connectivity are truly reflective of a promising future for ICTs and economic development. But it is equally possible that many of those visions are hugely overblown. The current evidence base is mixed and inconclusive. We therefore need to ensure that we do more to ask the organisations and entities who produce Grand Visions to justify their claims, refusing that it is self-evident that ICTs will automatically bring about development.

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