

FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL CATALYSING BROADBAND 4 AFRICA – ENSURING ECONOMIC AND SOCIAL INCLUSION

Gillwald, Alison;

Chair, C;Calandro, E;Mothobi, Onkokame;Rademan, Broc;Van der Spuy, Anri;

© 2018, RESEARCH ICT AFRICA



This work is licensed under the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/legalcode>), which permits unrestricted use, distribution, and reproduction, provided the original work is properly credited.

Cette œuvre est mise à disposition selon les termes de la licence Creative Commons Attribution (<https://creativecommons.org/licenses/by/4.0/legalcode>), qui permet l'utilisation, la distribution et la reproduction sans restriction, pourvu que le mérite de la création originale soit adéquatement reconnu.



Catalysing Broadband 4 Africa – Ensuring economic and social inclusion

Final Technical Report

IDRC Project Number: 107386-001

Research organisation: Research ICT Africa (ASSOCIATION INC UNDER SECTION 21
REG NO. 2009/017831/08) PBO NO. 930034057
409 Old Castle Brewery
6 Beach Road
Woodstock, 7925
Cape Town, South Africa

Project Leader: Alison Gillwald

Research team: Enrico Calandro, Chenai Chair, Onkokame Mothobi, Broc Rademan
Anri Van der Spuy

Associates: Mariama Deen Swarray, Mpho Moyo, and Aude van Schoentegen.

Admin team: Ondine Bello, Hettie Dreyer and Vuyisile Sali

Date: 1 September 2018

Licensing: All research disseminated under Creative Commons Attribution Licence

Contact: Research ICT Africa
admin@researchictafrica.net
Tel +27 21 447 6332
Fax +27 21 447 9529

Contents

1. Synthesis	5
1.1 Household, individual and informal sector surveys	6
1.2 Capacity building	11
1.3 Communication and evaluation	12
2. Implementation and findings	12
2.1 Household, Individual and Business ICT Access and Use Surveys	12
2.1.1 Problem statement	13
2.1.2 Implementation and challenges	14
2.1.2 Beyond Access Focus Groups	17
2.1.3 Thematic studies	18
2.2 Connected Cities	22
2.2.1 Public Wi-Fi	22
2.3 Pricing transparency and affordability	23
2.4.1 Problem statement	24
2.4.2 Implementation and challenges	24
2.4 Broadband measurements	30
2.4.1 Brief introduction/preamble	30
2.4.2 Problem statement (and project objective)	30
2.4.3 Implementation and challenges	31
2.5 Open access broadband networks in Africa	33
2.6 Public-private interplays in Africa's broadband sector	35
2.6.1 Problem statement	35
2.6.2 Implementation and challenges	35
2.9 Digital Financial Inclusion	36
2.9.1 Background	36
2.9.2 Problem statement	37
2.9.3 Implementation and challenges	37
2.10 The state of micro work in Africa	38
2.10.1. Problem statement	39
2.11 Rapid Response	40
2.11.1 Zero-Rating	40
2.11.2 Ethiopia privatisation policy paper	40
2.12 Capacity building	41
2.12.1 Doctoral programme on The Digital Economy and Society	41
Professional Development	42
3. Partnerships and collaboration	42

3.1 AfriNIC	42
3.2 RANITP	43
3.3 CPRsouth	43
4. Consultancies/technical assistance	44
4.1 World Bank: Zambia ICT gap analysis	44
4.2 World Bank gender ICT gap analysis	45
4.3 ITU Uganda Government: Network readiness for Digital Uganda Vision.	45
5. Communications and evaluation	45
5.1 Communications	45
5.1.1 Problem statement	45
5.1.2 Implementation	46
5.2 Evaluation	48
5.2.1 Implementation	48
5.3 Credibility and influence	49
5.3.1 Key Resource Person: ITU World Telecommunication Indicators Summit	49
5.3.2 Key resource/keynote address: ITU Africa Region Economic Dialogue on Digital Economy	50
5.3.3 Internet governance	50
5.3.4 Appointment as associate editor to the ITU journal	50
5.3.5 Invitation to join Canadian delegation to WTDC 2017	50
6. Looking forward	51
6.1 Capacity building	53
6.1.1 Doctoral programme	53
6.1.2 Executive development certificates/master classes	54

1. Synthesis

The IDRC grant “Catalysing Broadband in Africa - ensuring economic and social inclusion” has been used to support the research agenda of Research ICT Africa (RIA) in the context of the dynamic and increasingly complex global ICT sector. Specifically, it focusses on the policy implications for African countries, and their poor in particular. It consolidates the three-pronged programme that has underpinned RIA's work to date: research to build an evidence base for policy and regulatory decision-making; capacity building on the basis of relevant research; and technical assistance to policymakers and regulators. On the basis of this research, RIA has completed various projects of the research agenda and has implemented a number of policy advocacy activities. The outputs of the research and emerging outcomes are aligned to IDRC's commitment to scaling innovations, including research innovations, to enhance democratic governance, education and economic opportunities.

Since the awarding of this grant nearly four years ago, RIA has continued to expand its research-to-policy influence as the only digital policy and regulatory think tank leveraging donor-funded, public-interest research to build research and regulatory capacity and provide technical assistance to African countries, multilateral agencies and development banks. It is the only organisation systematically collecting comprehensive supply- and demand-side data on ICT access and use for Africa that is in the public domain, thereby providing a strong and rigorous evidence base for decision-makers. In an increasingly complex global environment, this work is critical to understanding the underlying factors of rising digital inequality and identifying the exact points of policy intervention to reduce.

This research cycle and grant is complemented by two ongoing parallel IDRC grants that are cross referenced in this report. The survey component of this grant together with the After Access in Global South research and grant - the culmination of more than a decade of ICT access and use surveys supported by IDRC in Africa - are key to sustaining the supply- and demand-side assessment of policy outcomes in developing countries. They also provide the underpinning of the other research grant contributing to the development of new governance and regulatory frameworks to ensure citizens in developing countries are not marginalised from globalised markets, the platform economy and new technologies. The African Digital Policy Project is examining cyber policy, regulation and governance frameworks required for the changing nature of economic and social transactions: work, communications, transport, education, health and service delivery.

Many advocates of these new areas of research at the global level make a mistake by taking for granted the availability of hard data as the foundation of policy advice. As a result many of the emerging governance frameworks assume the abundance that characterises the Internet and its derivatives in the North rather than the institutional and resource constraints that pertain in developing countries. Most African countries suffer a severe shortage of basic ICT statistical data and analysis that is fundamental to correctly identifying points for policy and regulatory intervention.

National statistics offices and regulators generally do not collect the demand-side data needed to measure ICT access and use to determine current policy and regulatory outcomes and thereby identify points of policy intervention to meet public-interest objectives. They are therefore unable to report to international and multilateral agencies (ITU, WB, etc.) for said agencies to accurately reflect the position of Africa in global indices. While the ITU collects supply-side (subscribers/pricing) statistics, which are also drawn on by the WB, OECD and WEF for comparative evidence-based telecommunications policy discussions, no organisation collects corresponding demand-side (usage/spending) statistics across Sub-Saharan Africa.

For this reason, one can talk about service prices but not the actual affordability of services, except in broad terms (estimating affordability by fraction of income — where the fraction considered affordable is extrapolated from OECD survey numbers). Similarly, service uptake statistics (internet use, mobile subscriptions and non-usage rates, etc.) are very dated, unreliable, unsystematic and extremely inaccurate. Disaggregation of data by income level, gender, age and urban-rural demographics is not

possible with supply-side data. RIA's two flagship projects — *the household surveys* and the *pricing transparency portal* — continue from previous research rounds.

1.1 Household, individual and informal sector surveys

The household survey, however, was greatly pared down from the 17 countries surveyed at its height, to only three countries in this grant. The surveys of Nigeria, Kenya and South Africa, were to have been co-funded domestically. The reduction in the number of countries was as a result of funding cuts in the IDRC and RIA's inability to raise co-funding either from states or identified foundations. This was despite protracted discussions with Facebook, Google, USAID and A4AI. Mozilla made a limited contribution to the overall project that was not sufficient to cover a single country and was so used to contribute to the focus groups which were being undertaken. With the collapse of the dedicated funding promised by public institutions in Nigeria and South Africa, the funding was instead used for pre-survey focus groups looking at Internet access and affordability from a gendered and locational (urban-rural) perspective. RIA subsequently managed to collaborate with the Nigerian Communications Commission and receive some co-funding to produce the integrated supply- and demand-side 'State of ICT in Nigeria' 2018 report. In South Africa, RIA received a small grant from the South African domain name registry, ZADNA, to support the integrated supply- and demand-side analysis published as the 'State of ICT in South Africa' 2018 report.

IDRC subsequently funded another five African countries as part of the After Access Global South Survey, which, together with the ITU and SIDA, brought the total number of funded countries to 10. The results of this research have been reported as part of this grant since the funding for the thematics was located here.

In order to collect a range of household and individual ICT indicators (including access to and use of fixed, mobile and internet services; ICT spend; non-users' willingness to pay etc) that meet the threshold compliance of the WSIS-initiated Partnership for Measuring ICT for Development, RIA ran nationally-representative household and individual surveys. The low cost for a nationally-representative survey is achieved by using an adjusted World Health Organisation sampling method based on the census sample frame. This permitted a far smaller sample of 1 800 households and 1 800 individuals on average per country surveyed. This is weighted to reflect urban-rural demographics. Being nationally representative enables disaggregation of the data by sex, income, education and location (urban and rural). It would not, however, be representative at any district or municipal level which most national statistical offices desire, but which increases the cost of the survey by a factor equivalent to the number of sub-national areas that are to be included.

The thematics proposed from the household surveys were collapsed in the budget presented by the IDRC into Connected Cities, under which one of the thematics (Urban Poor) had been proposed and budgeted, and the contribution by the IDRC to the Digital Readiness assessment done for the Government of the Western Cape and the City of Cape Town. As described below, the budget has been used to cover the thematics for Gender, Youth and Urban-Poor as per the approved proposal. The over-run on the Youth and ICT quantitative and qualitative study described below was also supplemented with the funding available from the Digital Finance project (which was never able to take off as a result of the proposed mobile operator partnership not materialising). The outputs from the thematic areas were rich and have been presented at various international and national forums, providing an African lens and contributing to a more informed discourse on these subjects.

Besides highlighting the unevenness and limitations of Internet access and use associated historically with limited connectivity (infrastructure and services) the analysis and modelling of the data highlights that to redress digital inequality in the Global South, far more attention will need to be paid to measures that stimulate demand. Even where enabling environments which are conducive to investment have been created for the extension of networks, our survey data illustrated how the socially and economically marginalised — particularly those at the intersections of class, gender, race, or ethnicity —

are unable to harness the Internet to enhance their social and economic wellbeing. The data available shows that besides affordability, human development — particularly education and therefore income — are the primary determinants of access, intensity of use, and use of the Internet for production and not only consumption. The development of relevant local content and applications in local languages, along with the enhancement of citizens' digital literacy skills, are all important demand stimulants. But until fundamental offline inequalities are addressed they will be replicated, and even amplified, online.

Gender

From the After Access Survey, a comparative assessment of gender inequality across the seven countries surveyed was undertaken. As with Internet penetration, gender tracks GDP per capita — with the highest-penetration countries, such as South Africa, having lower gender gaps and the least developed countries, such as Rwanda, Tanzania and Mozambique, having larger gender gaps. But penetration does not always correlate exactly with GDP per capita. Tanzania, which has a lower GDP than Rwanda, Ghana and Kenya has a smaller gender gap. Rwanda, which has only nine percent Internet penetration, has by far the largest gender gap of 60 percent, nearly double Tanzania (32%). Modelling of the data confirms that education, and the associated factor of income, determine both access to and use of the Internet. The results of the African survey were written up in a paper on Digital Inequality in Africa — granting its focus to gender — that has been submitted to Telecommunications Policy for publication. The results were also used for the African component of a book chapter edited by Alison Gillwald with contributions from RIA for Africa, from LIRNEasia for Asia, and from DIRSI for LatAm, in a book edited by United Nations University (UNU) for the ITU Equals project. A policy paper edited by Alison Gillwald drew on this research to produce another policy paper: “Understanding the gender digital divide in the Global South”. This research won the “Equals in Tech” award for research in September 2018.

Youth

The ‘Youth’ study sought to understand the way in which young people make use of the Internet within particular contexts as part of the After Access research series. The arising policy question was: ‘What are the best approaches to ensuring that Internet access and use benefits youth within a context of poverty?’ The research investigated — from young people's own perspectives — whether the Internet could be used to address the various issues they face, thus allowing us to formulate a range of suggestions for policy intervention. The paper and its policy recommendations focussed on youth in Tanzania, Nigeria and Rwanda, drawing on the After Access survey data and focus group discussions held in all three countries. Because ‘youth’ demonstrate very different characteristics between age sub-groups, the focus groups were disaggregated into teens (15-19) and young adults (20-24), by location (urban and rural) and sex (male and female).

This research was conducted in collaboration with a youth research expert, Dr Ariane de Lannoy, from the University of Cape Town. Dr de Lannoy brought in her expertise of understanding the issues young people face in Africa and assisted in the project design, training of focus group facilitators, analysis and write up. A policy paper on ‘Youth, Deprivation and the Internet in Africa’ was produced, as part of the After Access policy paper series.

Microwork

The purpose of this research was to analyse and disseminate the 2017 ICT access and use data on platform work. The question had been included in the data to support a study of microwork in the Global South, led by Hernan Galperin from DIRSI. Unfortunately, RIA was not included in the arising research project but the data has been successfully used to develop an early-stage policy paper, which has enjoyed much traction as the only demand-side research on microwork in Africa. It shows quite different results from both LatAm and Asia, and perhaps the absence of microwork is most striking. Versions of the policy paper have been presented at global fora such as the IGF and will be presented at the UNCTAD e-week and will also be presented at the UNCTAD e-Africa.

This research also prompted a collaboration with insight2impact (i2i) with an objective of mapping demand-side data and supply side data to gain deeper understanding of the nature of platform economy in Africa. It has also attracted attention from people working on global Internet governance such as the Oxford Internet Institute and led to the partnership in South Africa with Oll on the Fair Work Foundation, an initiative to accredit platforms according to their compliance with ILO labour standards.

Financial inclusion

The digital finance project was adjusted into a financial inclusion analysis using the 2017 survey data. The project uses the findings from the household and individual user survey to assess the status of financial inclusion in the different countries, but also as part of a project to understand demand for content and applications for entrepreneurial development, and to fulfil local content demand expressed in the surveys across all countries.

The purpose of this project is to understand the impact of financial applications and financial innovations, such as mobile money and digital finance, on financial inclusion in Africa. Digital finance in Africa was kickstarted by mobile money innovations in Kenya in 2007. Mobile money services, commonly known as M-Pesa allowed users, including those who were deemed unbankable by the formal financial sector, to transfer or receive money using their mobile phone number as their mobile money account number.

The survey findings of the 2017 RIA After Access survey suggest that even though the majority (70%) of residents from the surveyed countries do not have access to formal banking services, mobile money services are only commonly used in Kenya, Uganda and Tanzania. The poor performance of mobile money services in other countries such as Nigeria is mainly due to regulatory requirements which require mobile phone users to have a bank account. Furthermore, the Survey shows that mobile money platforms are a substitute for Internet banking services and in countries such as South Africa, which performs better than other African countries in terms of financial inclusion, mobile money was out-competed by Internet banking and mobile banking services. The findings also suggest that even though mobile money allows users to transact, that is to transfer or receive money and make payments, it does not wholly provide financial inclusion as the majority of the users cannot access credit.

Pricing transparency project

The Pricing Transparency Project which produces the RIA African Mobile Pricing (RAMP) Index has emerged as a key project for RIA in terms of research to policy becoming the gold-standard on pricing in Africa. It has been used for RIA to serve as a friend of Parliament to provide input to the South African Parliamentary Portfolio Committee on Telecommunications and Postal Services for hearings on the cost of communications, and for expert testimony at the Competition Commission of South Africa's enquiry into pricing collusion. In Botswana, it led to the intervention of the President into broadband pricing and an instruction by him to the regulator to determine the cause of Botswana's high prices.

As indicated below, it has innovated pricing indicators and measurements. Dr Mothobi Onkokame has also participated in the ITU Expert Group on ICT Indicators on developing appropriate indicators for prepaid mobile markets and the assessment of pricing measures for developing countries by the ITU. As a result of measurement innovations and an effort to make the pricing portal more interactive, the portal was re-designed and more human resources were put into the quarterly collection of data. IDRC approved the transfer of funds to the pricing project from the collapsed Digital Finance project reported on in the previous report, and that was used to fund the project through to September 2018.

As will be seen from the policy brief summaries below, the pricing information has been one of the most useful instruments in taking research to policy influence. The RAMP Index has become a reference point of governments, multilateral agencies and researcher. It has been used by parliaments and

governments to compel regulators to regulate prices and as a vector for the need for publicly aggregated access points such as free public Wi-Fi under conditions where even cost-based prices are not affordable for the majority of citizens.

The data portal has been used formally in bank or multilateral agency funded technical assistance in Mozambique, Uganda, Lesotho and Zambia.

The quality of service and broadband measurement project

As reported on previously, this project got off to a slow start with a lack of responsiveness from the Lagos Business School as our partner organisation. Kenyan and South African measurements nevertheless went ahead, and in the last reporting period Nigeria came on board and submitted a draft report on QoS in Nigeria. Broadband performance data has been used in technical assistance reports in Uganda and policy papers for South Africa and Kenya. Nevertheless, RIA's internet measurement work had received greater exposure at regional and international fora rather than at the national level.

A new study on measuring broadband performance from a content hosting perspective was presented at International Telecommunications Society in Zambia in May 2018, and the UPENN/CIPESA Internet Research Policy Workshop in Uganda in May 2018. Later in the year a policy brief on the study was presented at CPRsouth 2018. The research was also discussed at the Africa Internet Summit in Senegal, in June 2018, and our Mozilla Fellow, Sarah Kiden, together with Dr Josiah Chavula, presented the research on broadband performance at the M-Lab Annual General Meeting in August 2018.

The nexus of pricing, quality of service and Internet measurement has become an increasingly important set of supply side indicators in a broadband and Internet environment. Even with network and service availability many people cannot afford to access the Internet in the always-on manner in which it was intended, nor can they often afford to buy not only the quantity but also the quality required for them to use certain cloud and platform-based services that are now the staples of the Internet. Collaborating on the measurement of the quality of services and network with regional and continental bodies, such as Afrinic, MLab and Princeton University has enabled the detection of shutdowns and other more subtle forms of censorship and social network taxation that enables a more comprehensive understanding of digital inclusion and exclusion.

Open access

This study was delayed by a slow start in Nigeria and Kenya, and was eventually finalised without final inputs from Kenya. Efforts to draw in our country partner at the University of Nairobi Business School who had assigned the project to associates of the school came to naught. A similar situation played about with Public-Private Interplay project, and RIA was forced to inform the University that the contract was being closed off without full payment as they were in breach of contract and unresponsive to efforts to resolve the matter.

The Open Access research nevertheless yielded significant value. In South Africa the research, which included an in-depth comparison with Red Compartida in Mexico, which South Africa had used as its role model. By the time the South African Government proposed an exclusive, state-owned open access network of all high-demand spectrum contrary to the public consultation process and the advice of consultants, RIA had a fully-developed assessment of the potential and risks associated with such a network in the context of the high levels of investment needed for next-generation network roll out.

The empirical insights from the case studies also enabled the contribution to collaborative work on openness and theories of open access to better inform policy.

Public-private interplays

For the Public-Private Interplays project all three case studies were finally signed off providing interesting insights into the reasons for the failure of public-private partnerships in developing countries, and

interesting alternative public-private interplays. Amongst these is a fourth case study on the implementation of the cybersecurity framework in Mauritius which leveraged the skills and resources of the high developed financial sector in the country. This case study was used to as the basis for a panel at IGF 2018 on multistakeholderism and cybersecurity organised by RIA together with the African Digital Policy Project fellow, Dr Ian Brown, and which enable us to engage with some of the leading scholars and practitioners in the field.

Public Wi-Fi

With a natural experiment arising in South Africa with two of the largest provinces and cities adopting government or market-driven models for the implementation of public Wi-Fi as part of the national broadband plan “SA Connect”, a comparative case study was developed on the feasibility and value of each model.

The biggest factors in the supply-side comparison were: who funds, builds, manages and owns the network. This chain of factors (in addition to others) dissected the different models of supply and revealed the success of a cut-and-dry model adopted by Project Isizwe that was funded by the Tshwane Municipality to set up its own network independently. Their user data revealed how beneficial their hotspots have been in communities where mobile data is a less affordable alternative. Students reported using public Wi-Fi mostly for educational purposes, emailing and participating in social networks. Unfortunately, the Western Cape Government’s appointed provider, Neotel, was not as forthcoming with its data and its value to users was somewhat opaque; but it was noticeable how the restriction of hotspot placement to public buildings limited user access.

The integrated report was presented at the global UN IGF meeting in Mexico, in 2016, and a leaflet was also disseminated for stakeholders and policy-makers who required evidence in support of certain public Wi-Fi initiatives. It has also been used to inform various municipal and provincial public Wi-Fi workshops and initiatives.

Zero-rating

Rapid response funds were used to undertake research on the issues of zero rating in the African context in the light of calls for the banning of zero-rating as a breach of net neutrality principles. A supply-side study of Over-the-Top (OTT) services and net neutrality was undertaken to determine the extent of zero-rating in Africa and its competitive impact, and the policies and regulations that may be developed in response. It followed the global debate on the anti-competitive outcomes of the zero-rating of data for OTTs, and the alignment of efforts by telcos and certain activists to have them regulated.

It assesses the products offered in selected African markets, in this case in Kenya, Ghana, South Africa and Nigeria, and provides a high-level description of the market as well as Internet uptake rates/penetration.

The resulting report found that from the operators’ perspective, zero-rating is among numerous pricing strategies used, and policymakers and regulators have adopted a ‘wait and see’ approach to zero-rating pertaining to the violation of net neutrality. RIA recommended that an innovative and flexible approach to policymaking is required in this area, and served as a friend of Parliament in South Africa when it held public hearings on OTTs early in 2016.

The report, which challenges conventional wisdom and technocratic notions of net neutrality, was used to engage on issues of access and affordability in public policy. The paper was widely cited in the debates around whether African countries should adopt India’s ban on zero-rated services, and in several jurisdictions played a role in ensuring that competition regulations were not instrumentally applied.

Ethiopia

The final rapid response project was the preparation of a background public policy paper in response to the announcement by the Government of the Free Republic of Ethiopia of the intended privatisation of Ethio Telecom, around which there has been intense interest and discussion. Ethiopia has long resisted the reforms that saw first the mobile and then broadband revolution in other African countries. The privatisation will not only address the debt burden of the state-owned enterprise but also create a dynamic ICT ecosystem, that in turn creates more jobs and innovation. The policy paper by long-standing Ethiopian RIA partner, Dr Lishan Adam warns that privatisation alone is not sufficient to bring about telecom sector improvements. Drawing on the now extensive empirical evidence from around the world and in Africa, he demonstrates that a series of activities should accompany the announcement to privatise the incumbent operator. Most significantly, an innovative valuation exercise for the country is the proper sequencing of regulation, competition and privatisation.

The following sections describe in detail the research statements for each project, their implementation status together with a description of the challenges encountered during the implementation, and the main outputs and outcomes.

1.2 Capacity building

RIA's capacity building efforts in this grant were focused on establishing high-level research capacity to develop evidence for African decision-makers in the emerging areas of the digital economy and society. The intention of the programme is to nurture policy intellectuals able to engage critically with national, continental and international public-policy processes emerging from the evolution of the Digital Economy and Society in Africa.

The strategy to achieve this was to build supervision and doctoral capacity at the Lagos and Nairobi Business Schools as well as the University of Cape Town, where Professor Gillwald was already supervising a number of Amy Mahan Scholarship students in more traditional ICT policy and regulation at the Nelson Mandela School of Public Governance. So far, three doctoral students have graduated, one student is in his third year.

Unfortunately, LBS had put a moratorium on doctoral registration until it has addressed its supervision shortage and the NBS could not find ICT policy and regulatory specialists to supervise students in the area. Using the under-utilised student and supervision funds from the two institutions, six students from LBS, NBA and UCT, together with others that had applied from other institutions were brought together at UCT for research and methodology workshop facilitated by senior Nelson Mandela School of Public Governance staff to provide them with the kind of support that students gaining entry to many developed countries would get.

Over five days the workshop covered research design technique and methodologies that were applied to the students preparation of a proposals that would meet the threshold level of a first tier African university such as UCT. The intention was to assess at the end of the workshop who would be able to proceed with a PhD and to identify specialist co-supervisors with Prof Gillwald. Of the six students, four had developed their proposals sufficiently developed to register. One is studying the governance of multi-sided markets in platform economy in mobile markets in Africa; another blockchain as a technology to enable more transparent and accountable public sector delivery; the third is assessing the demand side aspects of microwork/work in the gig economy; and the other is examining the cyber-policy framework required to create a trusted environment for digital takeoff.

RIA was to have conducted a professional development workshop on key areas arising from the research for policymakers and regulators. Three seminars which could be integrated into a three-day course but could also be attended individually, were tagged onto the ITU Telecom 2018 which was held in South Africa. Drawing on our research findings and collaborations three topics and faculty were identified and advertised — Developing reliable indicators; Cybersecurity and human rights; and

Alternative access strategies, innovative spectrum use and community access. The funds from this grant were to pay for the course development, the time of faculty and the flights of a few that were not intending to be at ITU anyway and some bursaries. There was interest in the course but not necessarily from people who would be attending ITU, though we did get one or two of those, but overwhelming regulators indicated they did not have funding to attend the course and with less than 10 people signed up for each the course was cancelled. Some of the funding for the course was transferred to ensure the African School of Governance 2018 went ahead, and which was offered in Zanzibar by the Association of Progressive Communication and RIA in Zanzibar prior to the African IGF.

We have been building relationships with the African Union and SADC to funnel our research into their work programmes, conferences, piggy-backing our events and training on their captured audiences. This seems to us a far more likely way of getting capacity building which has been so important to our research to policy influence undertaken in future.

1.3 Communication and evaluation

The development of a clear and integrated communications and evaluation strategy that arose from the DECI evaluation has resulted in our including of communications as one of our core strategies in our Theory of Change, together with research, capacity building and collaboration/networking with the view that communications and evaluations help RIA achieve its vision and mission in the region. Funds from this grant were reallocated to the appointment of a researcher as per the DECI method to undertake ongoing evaluation and communication of the research to policy influence. In the revised 2017, ToC communications and evaluation processes are iterative at all levels of the ToC to maximise internal and external visibility and therefore cyberpolicy impact.

Using the IDRC sponsored DECI mentorship programme the Communication and Evaluation function was formally established within RIA in June 2016. The communication strategy was previously rather intuitive and not formalised, and dependent on the activity of the Executive Director. The strategy now focuses on RIA's networks and hubs of influence as well as opening pathways for RIA to build strategic relationships with governments, donors, public policy experts, and other key partners. The purpose of having evaluation in house is to improve efficiency and effectiveness of projects, build capacity in terms of reviewing project logic, and influence the communications strategies based on the project purposes aligned with the overall RIA purpose. While previously it was a function conducted through external evaluation, having this function in house improves RIA project development and delivery. To ensure efficient communications strategy, an internal and external strategy have been developed. Internally, the purpose of the strategy has been to build capacity for all researchers to develop communications strategies at a project level aligned with the overall RIA process.

2. Implementation and findings

2.1 Household, Individual and Business ICT Access and Use Surveys

The overall objective of this project is to catalyse evidence-based policy change that enables people to improve their lives through the use of information and knowledge that is shared and accessed via ICT. It does so by enhancing the decision-making process related to development – specifically the development problems that can be solved (or only partially solved) by knowledge, information and technology. In order to achieve this objective, the project approaches these issues through a post-development perspective – one that does not look exclusively at the question of physical access to ICTs. Rather, the primary purpose of this research project is to better understand the new #afteraccess challenges and to build an evidence base for demand-side intervention through survey data collection, indicator development, and analysis.

The growing importance of Information and Communication Technologies (ICTs) to achieve the UN Sustainable Development Goals (SDG) has been widely acknowledged. ICTs form the backbone of

today's digital economy and have enormous potential to fast forward progress on the SDGs and improve people's lives in fundamental ways.

But while in many instances, digital technologies have boosted growth, expanded opportunities, and improved service delivery, their aggregate impact has fallen short and is unevenly distributed. Yet, the truth is that we do not have demand-side data from developing countries, and therefore in our global statistics, to determine where we are now or to know what progress we are making towards overcoming the 'digital divide'. Therefore, our understanding of factors influencing digital inclusion and exclusion – in particular those 'beyond access' - is still limited.

2.1.1 Problem statement

The World Development Report 2016 acknowledges that while in many instances, digital technologies have boosted growth, expanded opportunities, and improved service delivery, their aggregate impact has fallen short and is unevenly distributed. To get the most out of the digital revolution, countries also need to work on the "analog complements"—by strengthening regulations that ensure competition among businesses, by adapting workers' skills to the demands of the new economy, and by ensuring that institutions are accountable. The recently approved Sustainable Development Goals (SDG) also include ICT access and use into the purview of the new targets. Yet, our understanding of factors influencing digital inclusion and exclusion – in particular those 'beyond access' is still limited.

The challenge of getting the most out of the digital revolution is particularly pressing in the Global South which is undergoing rapid social and economic change as a result of the confluence of mobile and broadband technologies. There is mounting evidence that broadband directly contributes to job creation and stimulates economic growth. The improvements in the flows of information and the reduction in transaction costs not only improves the efficiency of business but enhances the well-being of those who are connected to the Internet. But, there is also evidence of an increasing divide not only between those with access to such services and those without access, but between those who are connected with the means and skills to utilise the Internet optimally and those who are not. From a policy perspective this requires extending interventions to address inequality from those focused purely on supply side investment and operator-based strategies to those focusing on demand side challenges. The major challenge here remains affordability, but also a range of others enabling or enhancing digital inclusion factors – education, income, gender related, e-skills of various kinds at various levels, content and language, and rights to privacy, to safety and security online, to freedom of expression.

Human capability factors determine digital inequality outside of the traditional communications sector. These factors, combined with public-private interplay in the supply of ICT and the crosscutting nature of ICT in the economy and society, imply that integrated and coordinated policy responses are required from the State. While access to affordable bandwidth will remain a key objective of any policy and a necessary condition for realising the benefits of broadband Internet, affordable physical access to ICT is by no means a sufficient condition for these benefits. Therefore, Governments also need to work on the "analog complements"—by strengthening regulations that improves education, create income opportunities for the poorer, reduce gender disparities, create e-skills of various kinds at various levels, deliver content in local languages, and protect rights to privacy, to safety and security online, and to freedom of expression.

The overall objective of this project is to catalyse evidence-based policy change that enables people to improve their lives through the use of information and knowledge that is shared and accessed via ICT. It does so by enhancing the decision-making process related to development – specially the development problems that can be solved (or only partially solved) by knowledge, information and technology. In order to achieve this objective, the project approaches these issues through a beyond-access perspective – one that does not look exclusively at the question of physical access to ICTs. Rather, the primary purpose of this research project is to better understand the new #afteraccess

challenges and to build an evidence base for demand-side intervention through survey data collection, indicator development, and analysis.

2.1.2 Implementation and challenges

As the co-funding for the Nigerian, Kenyan and South Africa survey was not forthcoming from the respective Governments as previously agreed, IDRC approved the consolidation of funds to cover the undertaking of the survey in two countries and ensure at least some were completed. As Nigeria is the most expensive to survey, it was dropped. As surveys had been delayed so long and RIA had been awarded additional funding for another three countries, the surveys were held over for comparative purposes and undertaken with the other countries in 2017 in the separate “Beyond Access grant”.

RIA was commissioned by the ITU/Lesotho Communications Authority to undertake an integrated supply and demand-side, for which the survey instruments were updated in 2016 to focus on the challenges beyond connectivity. This was highlighted in the preparations for the Lesotho study which served as a pilot. The demand side challenges were highlighted in the findings - It has 95 percent 3G coverage and 50 percent smart device penetration and yet less than 20 percent Internet penetration.

While the Executive Director continued to liaise with country partners and institutions, the acting research manager, Dr Enrico Calandro, took over a significant part of the project coordination and complex field work logistics with local partners, together with our new econometrician, Dr Mothobi Onkokame. All staff members with modules on their research areas - cyber awareness, mobile money, microwork, gender and so on, contributed significantly to the development of the questionnaire, the coding of the questionnaires on electronic devices, and curating the data and development of indicators. RIA is also collaborating with DIRSI and LIRNEasia on the sharing of databases and development of indicators arising from the shared survey instrument as part of the global communications strategy for the renamed After Access project.

Dr Christoph Stork served as technical advisor for Kenya, Mozambique, Tanzania, and South Africa and Dr George Sciadas as arbitrator on substantive disputes. Mariama Deen-Swarray, who was previously managing the surveys as a RIA staff member, but now acts as an associate from Sierra Leone, has provided training and support for the piloting of the surveys in Nigeria, Rwanda, and Ghana. She also covered Senegal, which was a country covered by the SIDA funding. In each country, a RIA country partner has provided logistical support, has liaised with the national bureau of statistics and regulatory agencies for the necessary enforcement to conduct the surveys, and to obtain the sample based on the census.

In addition, in April 2017 Research ICT Africa commissioned iKapadata (Pty) Ltd with the execution of the Household and Individual ICT Access and Use Survey in South Africa, as well as the fieldwork management and quality control for the same survey in Mozambique, and then in Uganda in 2018. iKapa is a specialist research survey company based in Cape Town.

iKapadata introduced digital solutions to improve listing, quality control, and data management. The iKapadata listing solution replaced the paper-based method from previous RIA surveys. The solution involves capturing every household and business in an Enumerator Area (EA) using a mobile form and GPS-enabled device. The use of GPS for the listings was crucial as team leaders were notified on Slack, by a backend system, if a fieldworker did a listing outside an EA. In Mozambique, the fieldworkers were warned directly on the device if they tried to do a listing outside the EA, thanks to a geo-fencing solution developed by iKapadata. The listings were submitted in real time and visualised almost instantly on an online map accessible to the in-office quality control staff, as well as the team leaders on the ground. After checking the map, quality control would either ask the team to go back and complete the listing by pointing out gaps on the map, or confirm that the listing was completed.

Once the QC staff was satisfied with the listing, they ran a Stata command developed by iKapadata specifically for RIA's sampling requirements. It basically creates two lists of all households and all busi-

nesses in a random order, and produces the following outputs: two printable lists of households and businesses with addresses, names and descriptions, two CSV files with the same information and GPS coordinates (for uploading to Google Maps), and another CSV file with additional variables (for uploading to SurveyCTO as a preload). All interview submissions were sent via the cellphone network after each interview (meaning that the data would still be available even if a tablet got lost or stolen) using Secure Sockets Layer (SSL) technology and stored on a server hosted by the provider of the mobile data collection platform, SurveyCTO. The data can be encrypted by a user-generated 2048-bit encryption key, meaning that not even SurveyCTO's engineers can see the data. The server itself provides the kind of data security that satisfies even the most sophisticated and demanding institutional review boards (IRBs).

In Mozambique iKapaData discovered a breach of fieldwork protocol on the final data was in which required the Uganda team to go back into the field. The erroneous practice did not occur during the pilot and only started to creep in gradually as the survey progressed, making it difficult to detect. They managed to contain the possible selection bias introduced by this behaviour (basically households or businesses categorised as empty never appeared on the sample lists) by identifying the wrongly categorised households and businesses in the data and even revisiting many of them in Maputo.

In Rwanda, where a research permit is required and clearance from the NSO of the results of any survey using the national census frame, the regulator contested the findings with which they were very disappointed. RIA's Rwanda partner, former public utility minister, met with the regulator and the NSO to get the sign off of the data, and the NSO said unless the regulator could demonstrate statistically why he should not sign off within a two week period, it would be signed off. This bought time for the Government so the results were not released for the Transform Africa summit, but there was sign off in time for it to be used as part of the comparative data for WSIS, Equals, IGF, where it has been shown despite being the poster child of the World Bank, ITU, WEF, it had the lowest penetration rate of the countries at 9 percent and with the highest gender gap and 60 percent.

Outputs

The outputs include a number of country case studies for the countries in which additional funding was sourced for supply- and demand-side analyses. Studies were conducted on the State of ICT in Lesotho, Mozambique, Nigeria, Kenya and South Africa (<https://researchictafrica.net/research/research-papers-and-publications/#a83efcdbb9c25160b>), in partnership with regulators in each of those countries. Although there was no funding contribution from state agencies in Rwanda, Tanzania, Senegal and Uganda, RIA collaborated with regulators, communications ministries and national statistical offices. As mentioned, thematic studies were also undertaken with subject specialists producing policy papers or publications on gender, youth, urban poor, micro-work and digital inclusion (<https://researchictafrica.net/research/research-papers-and-publications/#a83efcdbb9c25160b>).

Nigeria: State of the ICT sector report

The NCC received typeset and modifiable versions of the final integrated report after two rounds of input and feedback had been complete. The report was composed of supply and demand side analyses as well as that of global indicator measurements in order to conduct a diagnostic exercise that assessed the state of Nigeria's ICT sector performance.

The study's demand-side survey had the overall objective of measuring effective demand for ICTs (broadband and broadcast services); of assessing levels of access and use by households and individuals; assessing expenditure on communications and the awareness of available ICT services in the country; the use and impact of social networking and OTTs on access; use and affordability; and the awareness of digital rights issues. This demand-side analysis provides insights into the reasons for the low uptake of broadband and internet services in Nigeria despite the relatively low cost of data, and the now pervasiveness broadband coverage.

This is complemented by a supply-side analysis that was undertaken by RIA in conjunction with the NCC to provide a comprehensive view of the state of ICTs in Nigeria, and from which evidence-based policy and regulatory recommendations have been derived.

The review of the performance of the ICT sector included an assessment of current policy outcomes against objectives, including an analysis of the market structure and institutional arrangements; an analysis of the resulting access, pricing, finances of operators, insofar as data is available to undertake such assessments and identified the data gaps in the reporting requirements of operators; and proposing regulatory interventions or forbearance to maximise investments in the extension of the network while stimulating demand (as identified in the demand-side analysis).

Delivery of demand-side indicators and analysis is essential to inform evidence-based policy that is more accurate and timely, and which creates the data (time-series and cross-sectional) to enable in-depth analysis of policy outcomes and points of intervention. The data will allow regulators and policy makers to measure the impact of policies and regulation. International organisations (ITU, UNCTAD) would receive the only demand-side data in the public domain to verify supply-side data and enable the inclusion of Africa into comparative demand-side studies and analyses. The data is publicly available for further use by governments, research institutions, NGOs, industry and trade unions to enable more informed participation in public policy processes and to complement, and be informed by, other pricing, quality of services and institutional analysis research projects that collectively can provide a better evidence base.

South Africa: State of the ICT sector report

Without substantial support from the South Africa Government or ICT regulator, RIA partnered with the local domain name authority, ZADNA, which was at least able to partially contribute to the use of South Africa's Survey results and demand side data in an integrated report that used them to expose persistent supply side bottlenecks as well as the inconsistencies in the policy and regulatory framework.

To this end, RIA was unable to fund high-level interviews with key stakeholders in the sector, but nevertheless undertook a desk study to illustrate the main supply-side constraints that strongly condition the South African user's experience as well as the shortcomings thereof. The integrated report that has been developed contains the main developments in the sector since the conclusion of the last household survey in 2013, and draws out how the subsequent policy processes are playing a role in defining the ineffectual and outdated regulatory framework, dynamic yet imbalanced competition environment in addition to ICT access and use in the country.

The integrated report is being used to brief the National Planning Commission in Presidency on the state of the country's ICT sector as a means of prioritising the sector's dire needs and its continued importance for the economic and social well being of citizens and the country as a whole. The findings are aimed at this high level audience in order to display RIA's Survey findings and demonstrate the opportunity costs of not integrating into and participating in the growing global digital economy. Without addressing the digital divide in South Africa by creating an enabling regulatory environment and directly supporting its citizen's demand side interests and needs, the Presidency may otherwise be contributing to the country's steady backsliding in international ICT rankings.

The report has been actively received by the National Planning Commission and was presented by RIA's Executive Director to a meeting of the Economic Cluster of Government. The Executive Director was also invited to participate in a round table organised by the Adenauer Foundation and the NPC on the preconditions for the digital economy, where the report was extensively referenced as the only source of demand-side constraints on uptake. The Executive Director has been asked to lead the background paper on Digital Economy and Society for the 10 year review of the NDP in 2019.

Outcomes

The data has been presented nationally, regionally, and internationally, contributing to a number of events such as the Internet Governance Forum, the Mobile World Congress, the World Summit for the Information Society (WSIS) WSIS, World Economic Forum (WEF) Internet for All, UNCTAD e-week, the International Telecommunications Union (ITU) Telecom 2018, with intensive social networking campaigns at each to highlight the underlying research. This rich dataset has enabled detailed analysis and modelling, bringing much greater granularity to our understanding of developing markets and society and thereby to policy and regulatory recommendations.

RIA has publicised the findings through the African Union Commission, with whom we have been collaborating on the establishment of an African indicators portal for some time and for which there is finally now European Union funding in the pipeline to make happen.

The findings are perhaps starkest in Rwanda, where the regulatory authority whom we had been working on the survey with, did not want the results released as planned at President Kagame's annual Smart Africa meeting in Kigali. The Statistician General however, who was responsible for approving the research permit, gave the regulator two weeks to provide a basis for the survey not to be signed off for publication as he could not find any flaws. This provided the regulator with political breathing space until Smart Africa was over but officials at various meetings have challenged the finding of less than 10 percent Internet penetration and the largest gender gap of 62 percent, nearly double Tanzania.

It is RIA's intention to follow up on the Rwanda case to find out what explains the poor penetration rates and high gender inequality in a country that has been the poster child of multilateral organisations and development banks.

2.1.2 Beyond Access Focus Groups

Project description

The focus groups were conducted to understand why people use the internet the way they do. In addition, we sought to explain what the barriers to internet use were. Specifically, the objective of the focus groups was to obtain qualitative information about the various strategies that people used to access and use data for different purposes. The focus groups were funded by Mozilla and by IDRC, and focus on Rwanda, Nigeria, Kenya and South Africa. Mozilla also funded studies in Peru, India and Myanmar.

The focus group discussions were designed to test the following hypothesis:

- ❖ the use of subsidised services only forms part of data use;
- ❖ people do not move beyond the use of subsidised services; and
- ❖ using the internet first through subsidised services leave people with a lesser understanding of the Internet.

Communications strategy

The communication strategy was launched with support from Mozilla in two phases. The first phase focused on the Africa report and driven by RIA. Dr Gillwald attended the Mobile World Congress in Barcelona where she presented some of the findings. She also spoke at the Mozilla equal rating challenge semi finals in New York, hosted by Mozilla. Chenai Chair, shared findings of the report at the Internet Freedom Festival in Spain, Internet Freedom Forum in Nigeria and the Africa Internet Summit in Kenya. These presentations shared the findings with a diverse audience which included the business community, technical community and civil society. The second phase saw Mozilla launch the report as a global project with the Peru, India and Myanmar report. Their strategy focused specifically on releasing a press briefing on their website and to country press contacts.

Outputs

The full report “Internet use and barriers and user strategies – Kenya, Nigeria, South Africa, and Rwanda, is available at the following link <http://bit.ly/2hvZxZ0> . The findings have been used to inform the finalisation of the survey for the nationally representative demand-side survey in the seven countries. A research paper and policy brief will be developed from this research. We intend to work with country partners to identify the key audiences within their countries and thereby determine the best method of dissemination. The work will also be presented at national and global events that focus on issues of access.

Outcomes

Papers

Chair, C. (2017). Internet use and barriers and user strategies – Kenya, Nigeria, South Africa and Rwanda. <http://bit.ly/2hvZxZ0>

Media coverage

Rwanda Eye, Mozilla-Backed Research Reveals Heavy Use of Subsidized Data in Rwanda, <http://rwandaeye.com/mozilla-backed-research-reveals-heavy-use-of-subsidized-data-in-rwanda/>

Mybroadband, Price of data stops South Africans using the Internet, <https://mybroadband.co.za/news/internet/222351-price-of-data-stops-south-africans-using-the-internet.html>

Daily Trust, Research reveals affordability as barrier to internet access in Nigeria, <https://www.dailytrust.com.ng/news/business/research-reveals-affordability-as-barrier-to-internet-access-in-nigeria/208072.htm>

htxt.africa, #DataMustFall really is a thing and it's happening in Rwanda, <http://www.htxt.co.za/2017/08/02/data-must-fall-happening-in-rwanda/>

ITwebAfrica, Africa still grapples with barriers to internet access, http://www.itweb.co.za/index.php?option=com_content&view=article&id=163787

Nigeria Communications Week, Mozilla-Backed Research Reveals Main Barriers to Internet Access in Africa, <http://nigeriacommunicationsweek.com.ng/e-business/mozilla-backed-research-reveals-main-barriers-to-internet-access-in-africa>

Muslim community report, Mozilla-backed research reveals main barriers to internet access in African countries, <http://muslimcommunityreport.com/2017/08/01/mozilla-backed-research-reveals-main-barriers-to-internet-access-in-african-countries/>

2.1.3 Thematic studies

Funding for the thematic studies was covered by this programme budget so they are reported on below, together with the arising policy papers covering all the countries, as they are both part of this grant and the After Access project. Co-funding was received from the Nigerian Communications Commission for the Nigerian country report, ZADNA the South African domain name authority and for the South African country report and INCM, the Mozambican regulator for the Mozambique report.

RIA has also drawn in subject specialists in various projects to complement the ICT expertise within the organisation. This has been the case with the Youth and ICT thematic where we have been collaborating with Dr Ariane De Lannoy, a youth specialist in the SA Labour and Development Unit who is known for her ability to mesh together quantitative and qualitative methods. She has been designing focus group research with the RIA youth team in three African countries to complement the household ICT access and use survey findings. This has produced a profound piece of research on the potential of ICT in the context of youth and deprivation.

Gender

This is also being done with the gender research where RIA has started working with Michel Friedman of the Gender at Work team commissioned by IDRC to support the cyberpolicy think tanks. RIA has traditionally focused its efforts in this area on the indicator project, trying to move beyond the descriptive statistics that mask inequalities to model what are actual determinants of inequality and the degree to which those are gendered, rather than ICTs *per se*. In this regard it has worked with the ITU including the Expert group on ICT Measurement to refine a number of indicator definitions and providing some of the only in-depth demand-side data on the continent beyond simple census or household survey data. For nearly a decade Alison Gillwald, Mariama Deen-Swarray, Christoph Stork, Anne Milek, Chenai Chair and Safia Khan have produced a series of quantitative and qualitative papers refining and nuancing the understanding of digital inequality between men and women. In this next round of research RIA hopes to extend the binary notions of gender reflected in its work, which has conformed to official indicator definitions of UN and other multilateral agencies.

The 2017 #after access survey was designed to allow for sex-disaggregation, among other indicators. This demand-side data is nationally representative at the household level and for individuals who are 15 years old and above. The modules in the questionnaire designed for this study cover a range of ICTs, including but not limited to mobile phones, Internet and social media. It builds on the questionnaires used in 2008 and 2012 rounds of surveys; shifting the focus from the more traditional ICTs to the more recent ones.

The data has been analysed using a quantitative approach in the form of descriptive and regression analysis. The descriptive results analyse the gender differences in mobile phone ownership, access and use; Internet access and use; as well as access and use of social media. Guided by the descriptive statistics, the study further analyses the data using binary regression techniques. The logistic regression models developed allow the study to investigate the factors affecting ICT access and use and to establish the direction of the effects and the degree.

Although the modelling shows that the main determinants of this digital gap are education and income, these are themselves likely to be determined by cultural and social factors that this statistical data cannot measure. Some of these factors of exclusion are best captured by qualitative research. The research therefore draws on the focus groups undertaken together with Mozilla and the World Bank across four African countries as pre-test of gender matters arising from the previous 2012 survey, and some of the newer pricing and social networking drivers of Internet take up.

The gender analysis from the 2017 after access surveys had enabled much greater granularity in the analysis both in relation to adoption maturity in the mobile ownership market as compared to Internet. In some way the adoption curve is similar with greater equity between men and women as the long tail, the poor which are disproportionately women, come online. But Internet suggests gender variances between men and women even with early adopters and these appear to be different in more mature economies where there is greater participation by women and least developed countries. There are also significant intersectional aspects to equality, particularly in relation to urban or rural location. Rwanda for example which has the lowest Internet penetration rates of the countries surveyed despite the significant development bank supply side interventions in infrastructure roll out and computer ownership, also has by far the greatest gender disparity. South Africa however has very little disparity amongst men and women with more women owning mobile phones, and seemingly very little variance between men and women of similar education, income and location. Urban women are not only better off than rural women in South Africa but also considerably better off than rural men. The need to nuance our understandings of digital inequality in relation to the poor or to locate gender and the intersection of other inequalities, income education but particularly location is critical to addressing gender inequality in the digital realm.

Alison Gillwald and Mariama Deen-Swarray submitted a paper to Telecom Policy on the African findings of the After Access survey. In this regard Alison Gillwald worked on a UNU, ITU, UNWomen's *Equals* project collating gender and ICT research for a book. Efforts to move beyond binary notions of

gender, or even really explore gender in terms of power relations and patriarchy where not supported in the planning meeting for the content of the book held in Macau in 2017. Alison Gillwald edited the chapter for the UNU ITU Equals book UNU gender report and an After Access policy paper on gender. This work forms the basis of the UN Women ITU Equals research award, for which LIRNEasia submitted the After Access research, and which we won and for which all three organisations, DIRSI, LIRNEasia and RIA, were coincidentally in New York to accept.

The high level indicators were used on panel discussions at the Mobile World Congress, on the closed Ministerial track at the Mobile World Congress, the Connected Women/Equal gender roundtable, and a plenary gender session at the WSIS 2018 in Geneva which Alison Gillwald moderated.

While Chenai Chair has been the gender champion within RIA and will continue to take the lead on expanding the gender agenda together with the Executive Director, a RIA associate with gender expertise who joined RIA to assist with the development of the cyberpolicy unit, the African Digital Policy Project, Anri van der Spuy, who has undertaken gender research for UNESCO, IGF and APC. Following the organisational decision taken to explore alternative and feminist methodologies and research topics, and creating better gender learning environment with RIA, Enrico Calandro and Mothobi Onkokame will also actively build gender into their research.

Youth and ICT: Youth deprivation and the Internet in Africa

The Internet is presented as a panacea for the challenges that young people face, but this is not necessarily the case. The 2008 and 2012 comparative studies on youth between the ages of 15-24 (Deen-Swarraj and Chair, 2016), showed that there is increased mobile phone ownership and internet use by youth across the continent. Despite being drivers of Internet take up, young people's use of the Internet is not optimal, especially within contexts of deprivation. The arising policy question this research sought to answer was what the best approaches are to ensure that Internet access and use benefits youth within a context of poverty.

This research aimed to expand on the current understanding of young people's internet access and use by exploring in more detail, and from their perspectives, how youth navigate the internet space, find information, use it to their advantage, or deal with barriers to access and use. This study sought to understand young people's Internet access and use in the context of the challenges that youth within the African continent face specifically in Rwanda, Tanzania and Nigeria. The researchers explored if and how the Internet was used to address these problems. The study further investigated - from young people's own perspective - whether the Internet could be used to address the various issues they face, thus allowing us to formulate a range of proposed policy interventions.

The study responded to the following research questions:

- ❖ How do young people access information that is available online?
- ❖ What are young people doing with the information accessed?
- ❖ How, and to what extent do young people make use of information accessed online to address their social and economic challenges?
- ❖ Are young people making use of the internet for economic and social gains? What activities do young people carry out online?
- ❖ What challenges do young people face in accessing the internet and in optimal internet use?

An intersectional analysis of evidence was needed to understand the extent to which the Internet may address the challenges that young people face. This intersectional evidence was drawn from complementary quantitative and qualitative methodologies. The mixed methods use combined RIA's After Access 2017 quantitative survey data collected in seven countries with qualitative data collected through focus group discussions in three of those countries (Rwanda, Tanzania and Nigeria). Focusing on the three countries allowed for a triangulation of data. Simple descriptive statistics were drawn

from the data to provide an understanding of the type and extent of ICT use among the youth in each of the countries where focus groups were conducted. Data was disaggregated by age, gender and geography to provide a sense of variations within youth. The focus groups explored young people's access and use of the Internet in the contexts of continued deprivation, gender inequalities and generally restricted opportunities for upward social mobility.

The final policy paper was completed and published on the RIA website "Youth deprivation and the internet in Africa" by Chenai Chair and Dr Ariane de Lannoy. The policy paper finds that young people in the three countries assessed face the challenge of poverty and resource deprivation. Unemployment is high among young people close to a fifth turning to self-employment. For young women, gender stereotypes such as the lack of investment in their education or close surveillance of their activities played out. The internet was perceived to provide some solutions such as information for employment opportunities, educational support or skills building. However, its reach was limited as pointed out by young people, in that it could not address issues such as capital for business or addressing gender stereotypes.

Part of the research findings were presented at the IGF2017 panel on Youth and SDGs, organised by Mr. Donovan Gutteres, from the United Nations Major Group for Children and Youth.

In September 2018, Chenai Chair moderated a panel on Youth and Informal Employment Opportunities hosted by the University of Cape Town's Nelson Mandela School of Governance. The panel was part of the Building Bridges Initiative of the Mandela school "Addressing Youth (Un) Employment and Livelihoods in Africa". The youth paper provided background for the panel on the experiences of young people in using technology to address unemployment and how they participated in the informal sector. The outcome of this interaction was the use of the paper as a resource for the overall report outcome for the roundtable discussions.

The research was also accepted for the session on digital inequality at the 2018 CPRsouth Conference held in Mozambique in August. 2.2 After Access Survey and country reports.

Urban poor

RIA is also working with the African Centre for Cities on the urban poor project and towards building a Connected Cities project that challenges some of the Smart City hype and focuses on people, and particularly the urban poor. Prof. Gillwald supervised a Masters student who has drawn on the RIA survey data for South Africa. The student, Michaela Allen, received a double distinction for the thesis. The modelling undertaken with Dr Onkokame's assistance, revealed fascinating advantages and disadvantages of being urban or rural in relation to proximity to infrastructure and other resources. This will be extended to a comparative analysis of all the countries surveyed.

The conceptual framework and methodology built on the Barrantes Digital Poverty framework, with some important findings about managing the impact of low income, high internet use distortions by including students in urban poverty assessments. The removal of students (low/no income) for the first time produced figures of urban poor far more consistent with digital poverty measures in rural areas and microstudies in ghettos. Significant differences also appear in urban poor in middle income countries with access to infrastructure and those in less developed economies, though there are exceptions in that regard too. The contribution of this work is to understanding urban poor dynamics and this will make an important contribution to the limited literature on the topic.

The framework developed with the student will be used as the framework for the arising urban poor policy paper, which is far more urbanised and has far greater urban and rural access than most other African countries, and provides a useful counterpoint for comparative purposes across countries. The thesis analyses "... the relationship between mobile phone usage and urban poor development, using Roxana Barrantes' demand-focused Digital Poverty Framework is quantitatively applied to nationally representative data from the 2017 "Beyond Access" Research ICT Africa Household and Individual ICT access/usage survey. Results indicate that only percent 12 percent of urban individuals at the

Bottom of the Economic Pyramid (BoP) are capable of actively using their Internet-enabled mobile phones on a daily basis in meaningful ways. Although all Internet-enabled mobile phone users at the urban BoP are capable of using their devices to strengthen their economic, social and human capabilities; optimal usage is only predicted with a 5 percent probability in terms of both daily use and quality of opportunities generated for improved wellbeing. Accounting for the confounding presence of students, a Generalised Ordered Logit regression identifies digital literacy and mobile broadband affordability as primary barriers to the optimisation of Internet-enabled mobile phone use. In spite of ongoing regulatory pressure on operators to reduce prices, these findings highlights the current inefficacy of these efforts to promote greater digital inclusion among the mobile-data dependent urban BoP. This failure suggests a critical need for State policies to improve the viability of complementary and free aggregated access to mobile broadband alternatives, such as Free Public Wi-Fi, that can optimise the developmental potential of mobile phones for the urban poor. Such policies that additionally address digital skills needs of the poor are even better suited to equip the State to tackle key barriers of digital literacy and awareness as arguably more intractable problems to promoting effective ICT use and digital equality.”

The project was also used to support the Western Cape Digital Readiness Assessment undertaken for the Western Cape Government. It included undertaking a baseline study for the province prior to the rollout of the Western Cape Broadband Initiative which was to be followed by an end-line study in 2018.

2.2 Connected Cities

2.2.1 Public Wi-Fi

Project description

Supply-side and demand-side analysis of the various free public Wi-Fi networks in South African was used to compile an integrated report on the feasibility and value of each model. Christopher Geerds thoroughly compared the various models found throughout South Africa in order to highlight the features that contributed to successful network extension, while RIA researchers looked into the two most promising models: those in the Tshwane metropolitan municipality and in the Western Cape, run by Project Isizwe and Neotel respectively. The latter demand-side study sought to assess the user’s experience of free public Wi-Fi in those two networks and compare the analytics thereof.

The biggest factors in the supply-side comparison were: who funds, builds, manages and owns the network. This chain of factors (in addition to others) dissected the different models of supply and revealed the success of a cut-and-dry model adopted by Project Isizwe that was funded by the Tshwane Municipality to set up its own network independently. The user data generated by them and shared with RIA revealed how beneficial their hotspots have been to poor and needy communities where mobile data is a less affordable alternative. Students reported using public Wi-Fi mostly for educational purposes, emailing and participating in social networks. Unfortunately, Neotel was not as forthcoming with its data and its value to users was somewhat hidden, but it was noticeable how the restriction of hotspot placement to public buildings damaged user access.

Outputs

The integrated Public Wi-Fi report has been finalised and peer reviewed and the study has been presented at the global UN IGF meeting in Mexico, in December 2016. A leaflet was also disseminated during the UN IGF meeting for relevant stakeholders and policy-makers who required evidence in support of certain public Wi-Fi initiatives.

The urban poor project with African Centre of Cities also fall under this budget and as mentioned above draws on specialist insights into African cities and tries to counter some of the hype around smart cities by speaking about connected citizens and equality and smart townships (ghettos) – a project with the Western Cape Broadband Foundation.

Outcomes

Paper: Developing Smart Public Wi-Fi in South Africa: https://researchictafrica.net/publications/Other_publications/2016_Public_Wi-Fi_Policy_Paper_-_Developing_Smart_Public_Wi-Fi_in_South_Africa.pdf

2.3 Pricing transparency and affordability

Following the innovation and development of new products in African markets, RIA decided in 2018 to extend the information captured in the RAMP database to include prices of 100MB and 500MB pre-paid data bundles with daily, weekly and monthly validity periods.

Monitoring and evaluating voice prices in most African countries was the reason for RIA to develop its Africa Mobile Pricing (RAMP) Index which tracked prepaid mobile prices across all operators from 49 African countries. This has proved an invaluable research project and advocacy tool as it has been used to track the effects of changes in the policy and regulatory environment, as well as competitive pressures, on prices in the marketplace. The rigorous collection of this data has enabled the development of a credible and consistent longitudinal assessment of prices for regulators and multilateral agencies and advocacy groups.

RIA has historically used three different pricing baskets — a voice and SMS basket; 1GB/month basket; and the bundled Value for Money Index (VMI). While the first two were derived from OECD price comparison measures, the latter has been created internally as an assessment of new prepaid products on the market (more detail is provided below). A web portal has been designed in a way that any person can check all product prices and provide instant feedback. This measure increases the data quality and enhances transparency. Each product category has its own section on the portal with comparison at a continental level and at a national level that compares operators within a country.

Research ICT Africa (RIA) has continued collecting quarterly mobile pricing data from retail telecommunications operators in 49 African countries and has built up an extensive database in the process.

While the GSM mobile technology preference at that time resulted in more voice and SMS services being popular, both in provision as well as in consumption, it was in 2014 when mobile data products became just as popular and warranted capturing (in addition to excluding the highly unpopular post-paid products from the RAMP database). Thus, in addition to the OECD (voice/SMS) basket¹ that had been traditionally fulfilled, RIA captured prepaid mobile data prices and also created a Value for Money Index (VMI) for analysing price and value trends on the supply side.

It became plain to see then that, since 2011, the mobile telecommunications market was shifting markedly away from offering voice and SMS services towards data services carried by radio spectrum. This was also made clear by the number of data products and bundled services that operators, especially new entrants, began offering. Moreover, the complexity and variety of these products has increased as a means of competition for subscriber revenue, but the low-income and emerging market environments in Africa force operators to continue battling primarily over pricing levels and strategies.

Although there are streaks of apparent inactivity and pricing stability, RIA's data collection and population of the RAMP database consistently shows how competition (both in quantity — number of operators; and in quality — value of offerings/packages) leads to lower pricing. Additionally, such time-series analysis complements RIA's other supply-side research strategies that seek to correlate policy and regulatory interventions with market reactions.

This type of analysis has been performed in RIA's undertaking of ICT sector performance reviews for national regulators, in its influencing of policymaking with the dissemination of pricing policy briefs at

¹ Details are contained in Section 3: Methodological approach.

high levels of government, in its public presentation of pricing data, and in its unearthing of pricing trends and assumptions in research papers.

2.4.1 Problem statement

Broadband Internet access in general, and mobile broadband in particular, is becoming increasingly important to national economies and the personal lives of users. As of 2016, about 11 percent of the world's population had access to fixed broadband. While 30 percent of developed countries had access to fixed broadband, only 8.2 percent of developing countries had access to it (ITU 2016). However, while most low-income earners are not connected to fixed broadband, the introduction of mobile broadband services has the potential to reduce the digital divide and give the poor an opportunity to connect to the Internet. Unfortunately, high mobile data services and expensive smartphone devices have continued the historical digital divide.

When attempting to understand the telecommunications ecosystem of any African country, knowledge of the retail sector is one of the necessary ingredients. It is the frontier between and the tense supply- and demand-side forces that meet often unsatisfactorily in low-income and highly-unequal circumstances.

On the supply side, the availability and pricing of mobile prepaid products and services provides an accurate depiction of the commercial interests and strategies for value delivery for revenue extraction that can be triangulated with sectoral and administrative data, for example, to round out the picture of a given telecommunications sectoral activities. On the demand side, telecommunications users in Africa are embattled with poverty, digital illiteracy and other forces, such as gender or location, inhibiting their access and leaving them on the wrong side of the digital divide. Collecting retail pricing data for analysis can contribute to the understanding of one of those constraints, however, the complexity of the task is evidenced by the lack of other such databases.

Without paying for information collected by industry agencies, such as the GSMA, or private data houses (Google), RIA aims to continue keeping track of these important price trends while other organisations fail to do so (Tariffic). The modelling of baskets, creation and maintenance of a database, presentation of the data on a web portal, and analysis of the data for briefing policymakers is a project that holds significant and relevant purchase in political, commercial, research and public spheres.

2.4.2 Implementation and challenges

RIA planned to investigate affordability issues using not only classical supply-side and macro data to examine this issue and gain insights into communications spending and use strategies, but by also using household and individual demand-side data. Nationally representative ICT access and use survey data has allowed RIA to test assumptions on affordability for mobile and internet users. In the last policy brief on Tanzania, for instance, affordability was clearly identified as a factor affecting both Internet up-take and its use. Considering that mobile data prices are reasonably low, the 30 percent Internet penetration rate (RIA HH and Individual survey data, 2017) is an indication that the affordability of the input device — Internet enabled phones — in Tanzania remains a challenge. Of those that access the Internet, 70 percent are doing so from smartphones, indicating a strong preference for such devices. Smartphone devices seem to be the main obstacle to Internet penetration in the country. The RIA Survey shows that 70.2 percent of the population has no access to the Internet. Of those, 62.5 percent reported that the main hindrance to Internet access is smartphones being unaffordable. The Survey further shows that only two percent of non-Internet users consider data prices to be high (see Figure 4). This is in line with the RAMP 1GB Index which shows Tanzania to be among the countries with the cheapest data packages.

In 2015, new components were added to the Africa prepaid mobile and broadband pricing database. As voice revenues began to decline and user demand shifted from voice to data business models, RIA noted that voice and data tariffs could no longer be understood independently of each other. Across an increasing number of African markets, consumers were getting the best value for money

from bundled packages integrating voice, data, and SMS services where operators were competing most fiercely to retain and attract users. This resulted in RIA developing a new tool to analyse the value of different bundles in the prepaid market: the Bundled Value for Money Index (BVMI). The demand-side aspects of user strategies to access and use data need to be better understood to deal with claims being made, for example, in relation to zero-rating. It is hoped that when the household and individual user surveys do get underway the missing demand-side evidence will be provided to advise policy-makers and regulators.

In order to keep a record of each quarter's pricing data, collection is stored in a FileMaker database hosted by FMPHost. Over the last year, RIA's pricing team has built a new database in Filemaker to expand the collection strategy to 53 African countries, adjust to pricing trends in the market, maintain accountability through collection cycles and build RIA's capacity for database construction and management.

Data collectors capture the required information in specific fields on a country-by-country basis — country assignments rotate each quarter for quality checking and freshness. All operators' websites of a country are manually accessed and scanned for the cheapest products available before being stored with date, author and screen stamps. In the public interest, RIA captures only the cheapest products that fulfil each basket's requirements and displays them on the pricing portal, accessible from RIA's webpage. The basket methodology is as follows².

OECD: the OECD compiled a prepaid voice/SMS basket that RIA uses for comparative purposes and is made of the following costs: calls to on-net, off-net and fixed numbers at peak, off-peak and off-off peak (typically 00h00 until 06h00) times; in addition to on-net and off-net SMSs. The averages of these costs (by product) are then added together to form the 'OECD value' or 'score'.

DATA: the data basket is made of purely megabyte bundles that reach a particular size and validity period. The cheapest 100MB, 500MB and 1GB bundles are collected (or calculated) for periods of 1 day, 7 days and 30 days each. Hence nine baskets are captured, and often calculated by adding bundles together in the cheapest way possible.

VMI: the VMI is used to calculate the value of a multi-service bundle by adding all the relevant components together: credit/air-time, minutes (on-net and off-net), SMSs (on-net and off-net), as well as data (including social media bonuses), which is then divided by the USD exchange rate value of the bundle's cost. Bundles are considered relevant for 1-day, 7-day and 30-day periods and can be calculated if necessary.

All three of these bundles are converted to USD based on the average quarterly exchange rate for each currency, and this is performed for comparative purposes such as benchmarking practices, for instance. The creation of this Index, and its associated rankings, has proven a powerful tool in influencing policy.

At the time of writing, RIA's pricing team is investigating the costs and benefits of automating pricing data capture and display techniques on an open source basis to reduce the labour-intensive nature of the work. There may be a need to trial a MySQL or Google Sheets database in order to export data files for the online portal in a more simplified and timely manner, while the capture process could possibly be automated with 'web-scraping' coding tools. RIA aims to make final decisions on these possible progressions by the end of the 2018 calendar year.

Additionally, RIA's database can be expanded to collect quarterly prices for mobile postpaid, fixed broadband lines as well as wholesale data to holistically analyse the ICT ecosystem and its operations in a particular African country. Historically, these data have proven evasive (wholesale), insignificant (mobile postpaid), dated (ADSL subscriptions), or too complex to capture and compare (some prepaid

² More detail can be provided on request.

mobile markets). These obstacles have not evaporated, but the necessity of wholesale pricing data, for example, has only increased, and the popularity of mobile postpaid offerings grown too.

Research ICT Africa this year released seven policy briefs. The South African policy brief was well received by media and #DataMustFall movement. The South African policy brief is also quoted by the World Bank in the South African Economic Update Report (2017).

Outputs

The pricing transparency project supported by IDRC for the last eighth years, and now best known as the RAMP Index (RIA African Mobile Price), has provided the basis for regulatory and policy engagement in several countries, including Namibia and South Africa historically, and directly in Cameroon and Botswana recently. The RAMP Index has also been used by doctoral students, including RIA's own home-grown senior researcher, Dr Mothobi Onkokame, and Ryan Hawthorne assess the structure and competitiveness of African telecommunications markets.

The deliverables of the mobile broadband pricing project include:

- ❖ quarterly prepaid mobile time series data for 50+ African countries;
- ❖ quarterly policy briefs;
- ❖ interactive web portal;
- ❖ discussion paper for international fora on affordability indices; and
- ❖ peer-reviewed paper on affordability indices.

Below is a list of the findings and recommendations from each policy brief released in 2017/18.

Policy briefs: Rwanda (May 2018)

- ❖ Internet penetration in Rwanda is only 8.7 percent and mobile penetration is 48 percent — the lowest of the eight African countries surveyed in 2017, despite 95 percent 4G LTE population coverage and competitive pricing.
- ❖ It is only three percent behind Mozambique but significantly lags Tanzania which, despite being a least developed country, has double Rwanda's penetration.
- ❖ Rwanda also has a staggering 60 percent Internet access gender gap — more than double the average of the other countries surveyed, with South Africa being the top performer at 14 percent, followed by Kenya at 32 percent.
- ❖ Like the other least developed countries surveyed (Mozambique and Tanzania), Rwanda's 1GB prepaid mobile data market enjoys competitive pressure, and the incumbents are less entrenched in the country, resulting in a top-ten 1GB price ranking in Africa.
- ❖ Services are still not affordable for many with 33 percent of the few Rwandan Internet users saying the cost of data inhibits their use of it.
- ❖ The After Access Survey results further indicate that the low Internet penetration in Rwanda is a consequence of the prohibitive cost of Internet-enabled devices — 43 percent of Rwandans claim not to have devices that access the Internet.

Policy briefs: South Africa - supply side (June 2018)

- ❖ South Africa is ranked 35th out of 49 African countries on the RAMP Index's cheapest 1GB prepaid mobile data bundles.
- ❖ The cheapest 1GB of data in South Africa, offered by Telkom Mobile (ZAR99), costs seven times more than Egypt's cheapest, and three times that in Ghana, Kenya and Nigeria.

- ❖ Data prices remain unaffordable to the majority of people in South Africa, where 47 percent of the population does not use the Internet, according to RIA's 2017 After Access Survey.
- ❖ Although only half the population has access to the Internet, the penetration rate in South Africa is significantly higher than any other African country surveyed in 2017.
- ❖ Despite numerous public hearings on the cost of data, the new regulations announced by ICASA do not address this significant problem.
- ❖ Network coverage and service quality appear to retain even price-sensitive consumers, who may be attracted to Rain's new, incumbent-challenging 5c per MB offering.

Policy briefs: Botswana (July 2018)

- ❖ Botswana is not benefiting from investments made in high-speed undersea cables and is likely to not realise the digital dividend due to inefficient regulation.
- ❖ The Botswana telecommunication market is not sufficiently competitive and highly concentrated with an HHI of 4,150.
- ❖ Mobile operators use high data pricing strategies to limit the use of over-the-top services such as WhatsApp, Facebook Messenger and Skype voice calls.
- ❖ Botswana is ranked 40 out of 49 African countries the RAMP Index in terms of cheapest 1GB data basket
- ❖ The cheapest monthly 1GB data (USD12.69) in Botswana is eight times more expensive than 1GB in Egypt (USD1.69) and USD5.23 and USD5.43 more expensive than in Namibia and South Africa, respectively.
- ❖ Internet article: Impetuous policies increasing digital divide In Uganda: Social media tax
- ❖ Even though Uganda has the cheapest 1 GB data at USD 2.77, majority of Ugandans (78%) are not online.
- ❖ Effecting the tax will increase the cheapest data by a margin of USD 1.5 to USD 4.27, making it even more expensive for those who could not afford it.
- ❖ Those who marginally afforded the Internet services will be priced out of the market, increasing the percentage of the unconnected.

Policy briefs: Rwanda (May)

The policy brief initiated discussion between Research ICT Africa, the Rwanda Utilities Regulatory Authority (RURA) and the National Statistics Rwanda (NISR). The policy brief was discussed with a number of institutions, including the Minister of ICT, DG of RURA, DG of NISR, CEO of RISA and the operators.

There was a lengthy discussion on ICT indicators with the RURA claiming that demand side data is under-estimating penetration rates in Rwanda. While this seems to be a negative response, this initiated an engagement process where RIA highlighted the problems of using supply side data and the benefits of demand side. RIA highlighted that, in prepaid markets such as the African telecommunication market, with majority of people owning multiple SIM card, the supply side which is normally collected by the regulator from operators, ITU from the regulator and the GSMA is likely to over-estimate ICT indicators. RIA also highlighted that the only unbiased and efficient way of measuring ICT indicators is through a nationally representative survey.

Research ICT Africa was to present the finding of the After Access survey to a national stakeholder meeting, which will be attended by the Minister of ICT, DG of RURA, DG of NISR, CEO of RISA and the operators. However the regulator reneged following the release of the findings and the reluctance to have them released during Smart Africa annual meeting in Rwanda. Appeals to the Bureau of Sta-

tistics who had to provide the research permit and vet/approve the findings indicated that without the regulatory agency demonstrating that there was a flaw in the research he would be obliged to permit the release of the results.

Policy briefs: Botswana (July)

RIA's policy brief covering the telecommunications market in Botswana was shared with the Botswana Communication Regulatory Authority (BOCRA) and the Minister of Transport and Communications (MTC), Mr Kitso Mokaila. The policy brief was reported on by the main Botswana newspaper, The Botswana Gazette. Its timely release initiated a discussion between the Minister and BOCRA, which resulted in a review of prices and competition in the market. Following the meeting between the Minister and BOCRA, mobile operators were asked to respond to the RIA findings, a process which started a discussion between the largest operator, Mascom, and RIA.

Mobile operators were further directed to reduce the price of data by both the Minister and BOCRA. In the same month that the policy brief was published, Mascom reduced its data prices by almost half and other operators followed suit. The operators were also directed to reduce mobile termination rates, as the policy brief showed how high termination rate differentials create significant club/network effects and first-mover advantages which inhibit the growth of the late entrants like beMOBILE.

RIA is currently working with BOCRA to assess how the cost of communication, specifically data, could be a bottleneck to the country's desire to be an ICT hub. The country is currently in the process of implementing mobile number portability with the aim of reducing consumers' switching costs. Following our recommendation, BOCRA intends to conduct a market inquiry into data costs in 2019.

Policy briefs: South Africa - supply side (June)

The supply and demand side policy briefs were developed in tandem to publicise the findings of the State of ICT in South Africa reports and both have been released. The two policy briefs attracted media attention and together with the report, policy makers.. Our policy briefs have been used by a number of stakeholders, especially as evidence of how high the cost of communication is, and how it affects the majority of poor South Africans, but also how South Africa has much higher Internet penetration and better quality than many countries with much lower prices..

This policy brief has been used also by stakeholders calling for the review of data costs in the country. The Competition Commission is currently conducting data enquiry, a process which is benefiting from a number of RIA policy brief and the Research ICT Africa Mobile Pricing (RAMP). They have sought expert testimony and have paid for Mothobi Onkokame to make an oral submission on to the process.

Policy briefs: summary

SADC not bridging digital divide, Policy brief 6, September, 2017:SADC, https://www.researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017_Policy_Brief_6_SADC.pdf

Low Internet penetration despite 90% 3G Coverage in Lesotho, Policy Brief 5, August, 2017: Lesotho, https://researchictafrica.net/wp/wp-content/uploads/2018/01/2017_Policy_Brief_5_Lesotho-.pdf

Cost of Smartphones continues the digital divide in Tanzania, Policy Brief 4, August 2017: Tanzania, https://www.researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017%20Policy%20Brief%204_Tanzania%20.pdf

South African data prices static for two years but consumers not flocking to cheapest product offering, Policy Brief 3: South Africa, 2017, https://www.researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017_Policy%20Brief%203_South%20Africa.pdf

Disentangling the broadband divide in Rwanda: Supply-side vs demand-side, Policy Brief 2: Rwanda, https://researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017%20Policy%20Brief%202_Rwanda.pdf

Botswana telecommunications limp a decade after policy changes, Policy Brief 1, February 2017: Botswana, https://researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017%20Policy%20Brief%201_Botswana%20.pdf

Media coverage

How expensive phone data costs Batswana, <http://www.thegazette.news/how-expensive-phone-data-costs-batswana/>

SA users spurning cheaper data deals, <https://techcentral.co.za/sa-users-spurning-cheaper-data-deals/75796/>

Mobile rivals may ignore Telkom's price cuts, <https://techcentral.co.za/mobile-rivals-may-ignore-telkoms-price-cuts/67173/>

Data Cost must be reduced, <http://www.702.co.za/articles/244662/data-costs-must-be-reduced-ict-africa>

Namibia looks to ICT sector for economic recovery, <http://www.itwebafrica.com/ict-and-governance/263-namibia/240835-namibia-looks-to-ict-sector-for-economic-recovery>

Cost to Communicate: Research ICT Africa; Spectrum licensing; Election of Chairperson, <https://pmg.org.za/committee-meeting/25343/>

Find ways to bring high data costs down, report urges, <https://www.businesslive.co.za/bd/companies/telecoms-and-technology/2017-07-18-find-new-ways-to-bring-high-data-costs-down-report-urges/>

High-profile global multilateral coverage

Bonnici, F. (2016). "Internet freedom: why access is becoming a human right". The Conversation. Available at: <https://theconversation.com/internet-freedom-why-access-is-becoming-a-human-right-59125>

South Africa Economic update, World Bank, <http://documents.worldbank.org/curated/en/779551505322376708/pdf/119695-WP-PUBLIC-SA-EU-2017-Digital-Version-Sep-19.pdf>

Gillwald, A. (2018). "We don't have enough data to draw conclusions about the digital divide". World Economic Forum. Available at: <https://www.weforum.org/agenda/2018/08/we-cant-tell-if-were-closing-the-digital-divide-without-more-data/>

Doctoral thesis

Onkokame Mothobi, (2017), Essay on Telecommunications Demand and Regulatory Policies, UCT, https://open.uct.ac.za/bitstream/handle/11427/27066/thesis_com_2017_mothobi_onkokame.pdf?sequence=1

Outcomes

The RAMP database has been linked to several other public domain data portals including the UCT economics open data project 'Datafirst' from which there have been a number of follow-on requests by both PhD students and researchers, and from market research and commercial companies. The RAMP database is also available on a creative commons licence on the open portion of the commercial research and data company 80/20.

The various indices (Voice and SMS index; 1GB Index; Bundled Value Money Index) have been used as the basis for regional and national benchmarking and as the basis for debate in the South African

Parliamentary hearings on the Cost of Communication. The outcome of this process is that the dominant operator, Vodacom, has approached RIA to work with them and other mobile operators, as well as the regulator, to overcome some of the decision-making that has overtaken regulatory processes, or lack thereof.

Several governments and regulators request information for parliamentary inputs or public discussion documents and the African Development Bank recently requested the pricing data and analysis for their ICT sector performance reviews of three least developed SADC countries.

The data has been used by other types of institutions. For instance, in their submission to the Parliament Portfolio Committee (PPC) on the Cost to Communicate and Spectrum Framework, the South African government, Ministry of Telecommunications and Postal Services (presented by Mr. Robert Nkuna- Director General) heavily relied on RIA pricing information, policy briefs and the benchmarking report. In Lesotho, the pricing information was used to assess market competition and combined with survey data to assess affordability.

RIA's ongoing engagement with the Botswana regulator, BOCRA, on the high costs of data (despite their having amongst the lowest wholesale bandwidth, following the building of a national open access network) finally bore fruit. RIA had developed a policy brief that the regulator had initially requested we not release. After the delayed confirmation of the data by BOCRA, Dr Mothobi fed it to the local media and alerted the Presidency. This resulted in the early retirement of the CEO who had sought to block the release of the pricing study in Botswana, and initiated a pricing investigation by the regulator. This has resulted in the regulator requesting all operators to half all their mobile data prices, reduction of termination rates and no price differentials between on-net and off-net charges. The BOCRA board requested assistance from RIA's executive director with their appointment of a new CEO.

2.4 Broadband quality of service

2.4 Broadband measurements

2.4.1 Brief introduction/preamble

Although broadband penetration, particularly mobile broadband, is increasing across the continent, very little is empirically known about the performance of broadband in Africa. This lack of evidence is problematic since good broadband performance is key both to meet national broadband policy objectives and to improve the overall users' experience and delivery of internet services (including VoIP, online videos, cloud services, etc). Measuring broadband performance helps ensure consumers are getting what they paid for and that receive a reliable service. At the same time, it allows regulators and operators to make informed decisions on network investments and peering.

2.4.2 Problem statement (and project objective)

From a consumer welfare perspective, the flip-side of prices is quality of service. It is evident simply for private use monitoring that, not only are prices in Africa high, speeds are generally slow and consumers are seldom getting what is advertised and what they pay for.

Broadband Internet penetration has slowly increased all over Africa, particularly with the arrival of new undersea cables on the east and west coasts. Although most Africans still do not have Internet access (Research ICT Africa #AfterAccess surveys, 2017), the question arises about how those that do are experiencing broadband services and whether these services are delivering on the promises made by ISPs. In particular, it is unclear what the QoS is for existing broadband offerings in Africa. Yet, for broadband adoption to be increased in Africa along with projected benefits (Koutroumpis, 2009; Kim, Kelly and Raja, 2010), answering this question will help regulators monitor how ISPs are performing, and help us understand whether broadband consumers are receiving what they paid for – particularly since broadband in Africa remains very expensive.

2.4.3 Implementation and challenges

The research project started with a number of delays, due to a few factors. The initial plan to partner with the University of Nairobi and the University of Lagos to undertake the measurements and study in East Africa and in West Africa did not take off. After a few months of delay, we decided to partner with Walubengo John at the Multimedia University of Kenya, and with the Lagos Business School, since both institutions expressed an interest in working on this project. On the other hand, once the collaboration with them was finalised, the actual collection of measurement data became very problematic, specifically in relation to deploying probes (both Raspberry Pis/routers and MySpeed Test apps) in Kenya and Nigeria, and in keeping our probes in South Africa up and running. Regarding BISmark routers/Raspberry Pis we were relying on our informal research collaboration with Princeton University which developed the technology. Unfortunately, due to the informal nature of our collaboration, setting up milestones and keeping to deadlines for the installation of BISmark firmware on the routers or on the Raspberry Pis has presented a challenge. With regards to the deployment of MySpeed Tests, we realised that without incentives African users are not willing to download and run the app. After we became aware of this obstacle, Princeton University decided to fund one month of MySpeed Test deployment in South Africa and Kenya, to collect enough data for a study on Exploring the Walled Garden Theory on the use of Zero rating services. Aware of the need of incentivising users to download and run the MySpeed Test app, we decided to undertake a similar approach to continue our study in Kenya and Nigeria, and in both countries, with the support of our country partners, we run two campaigns to recruit users, and we reimbursed them 1USD each for downloading and running the app for at least one month. Although the campaigns were successful to collect enough measurements to assess broadband performance in the two countries, the country reports on broadband quality of service were not up to standard for policy papers publications, and therefore could not be published as stand alone reports. Nevertheless, their value in contributing to shed light on broadband performance in these countries have been acknowledged, and they have been published as chapters in the supply and demand side country reports on the status of ICT in Kenya, Nigeria, and South Africa.

In 2017, we tried to identify alternative ways to overcome some of the obstacles on collecting technical measurements, and on analysing them. And we saw an opportunity to compensate for the internal lack of technical skills through entering into a research MoU with AfriNIC (whose researchers have IT technical and networking skills). The partnership with AfriNIC has been successful in both influencing their research agenda (which is now focused on broadband performance) and in building our internal capacity on technical measurements. The partnership with AfriNIC allowed us also to move towards the collection of longitudinal and cross-country indicators for broadband performance and mobile use, through the use of additional measurement platforms, such as SpeedCheckers, and RIPEAtlas.

In 2017, we also partnered for the submission of a research proposal to the European Union led by Prof Giovannetti at the Anglia Ruskin University in collaboration with many research partners including the National Research Council of Italy, Queen Mary University of London, AfriNIC and Research ICT Africa, among others. The project is data collection driven aiming at identifying the main technological and market bottlenecks afflicting the provision of Internet in Africa, including broadband performance bottleneck. Unfortunately, after having been placed in a reserved list, the selection process was unsuccessful.

Towards the end of 2017, in an attempt to improve our internal skills on technical networking issues, we applied to the Mozilla Open Web Fellowship programme, and we were successfully selected as a hosting organisation, and Ms Sarah Kiden from Uganda joined RIA for a few months. Nevertheless, due to a number of delays in obtaining a visa to work in South Africa for a few months, Sarah effectively started her fellowship at Research ICT Africa only in February 2018.

More recently, we have been invited to present our research at the M-Lab Annual General Meeting in DC and we started to collaborate with them in identifying new countries to Africa to install measurement servers.

Outputs

A new research component of the study was developed in 2016 year when we measured mobile use behaviours in South Africa against the United States, comparing use on different connection types (Wi-Fi vs. cellular) as well as for devices on different data plans (prepaid vs. postpaid; monthly data cap vs. uncapped). The findings show that US users consume slightly more cellular data than Wi-Fi data for most of the country's top five most used applications, while South African users generally prefer Wi-Fi connections (with the notable exception of Facebook). Further, US users on postpaid plans display much higher average monthly mobile data use than those on prepaid plans, while South African users on prepaid plans generally display much higher use than those on postpaid plans. The paper on assessing pricing effects on mobile data use was presented at CPRsouth and came second in the best paper category. This paper was also submitted and published in Telecommunications Policy, Special edition on Africa.

Chen, A., Feamster, N., and Calandro, E. (2017). Exploring the Walled Garden Theory: An Empirical Framework to Assess Pricing Effects on Mobile Data Usage. Telecommunications Policy, Special edition on Africa.

The Nigeria and Kenyan cases studies on Quality of Service were complete in 2017. However, they lacked of depth and analysis to be published as stand alone studies, and therefore they have been included in national reports on the status of ICTs. Similarly, the Ugandan case, developed by the Mozilla Fellow Sarah Kiden, was included in the Digital Transformation Report on Uganda, and the South African case is included in the Status of ICT in South Africa report.

In 2018, a new research component was added to the study on QoS. The paper focuses on the impact of remote hosting on Internet performance. It reveals that although a considerable investment in broadband infrastructure has improved broadband speeds across many African countries, the reliability and performance that users ultimately receive is determined also by the interconnection between networks and Internet Service Providers (ISPs) and by where the content, services and applications are hosted. Often, high latencies to remote destinations introduce significant performance bottlenecks, suggesting that, in addition to investments in higher throughput links, effort should be devoted to improving interconnection between ISPs and locating content closer to the users.

The paper has been presented to ITS Zambia and accepted for a publication on Telecommunications Policy, special edition on the Global South.

The paper has been submitted also to CPRsouth2018 and has been accepted for presentation.

Calandro, E., Chavula, J., and Phokeer, A., (2018). Internet Development in Africa: A Content Use, Hosting, and Distribution Perspective. International Telecommunications Society Regional Conference, Lusaka, Zambia.

In 2017, there was considerable progress on collecting mobile broadband performance measurements by our research partner in Kenya and the data collected was analysed together with South African data. Although Nigeria experienced slower data collection than expected, in the second half of 2017 it changed its recruitment strategy and has showed some positive results, having submitted a draft report in December 2017. Nevertheless, since the final reports were not of high quality for a self-standing publication, it was decided to include research results in three country reports: The State of ICT in South Africa, the State of ICT in Kenya, and the State of ICT in Nigeria.

Our Mozilla Fellow, Sarah Kiden, worked also on the Uganda broadband performance data, and the analysis was included in a report on digitalisation in Uganda as part of an ITU funded technical assistance project.

In terms of conferences, the paper on assessing pricing effects on mobile data use was presented at CPRsouth and came second in the best paper category.

Together with AfriNIC Research ICT Africa co-hosted a two full-day workshops on internet measurements at the Africa Internet Summit, one in 2017 and one in 2018, and co-hosted a panel discussion on Internet measurement research at the Africa Internet Summit in Senegal in 2018.

In August 2018, Research ICT Africa was invited to present its research at the M-Lab meeting in Washington DC and both Sarah Kiden and Dr Josiah Chavula from AfriNIC/UCT4D attended. M-Lab researchers were impressed by our research on internet measurements and we have planned to put together our resources to further develop this important research area in the continent.

Outcomes

Through the Quality of Service project, Research ICT Africa established a number of new key research partnerships. RIA is the preferential internet policy research partner of AfriNIC, and we are now involved in a number of internet measurement activities undertaken by AfriNIC, including the WIDER platform on internet technical measurements, and on their research activities more broadly. We also strengthened our collaboration with Mozilla and with the Ford Foundation, and we have been selected as a hosting organisation for the Tech-Exchange programme, which is expected to bring into RIA new technical skills on data science, and database programming. For this collaboration we aim to employ a data scientist who will be in charge of broadband performance data analysis.

The collaboration with AfriNIC has been keen in establishing an African community of Internet measurement researchers. The internet measurement workshops at the Africa Internet Summit are always well attended (around 70 participants at each workshop) and we expect to organise similar workshops in future, in order to keep building a community on internet measurement researchers in Africa.

From an academic perspective, we have contributed to the building of internet measurement capacity at the UCT4D lab as we acted as a conduit between Princeton University and the UCT4D lab. Furthermore, the quality of RIA research has been recognised at the ITS conference in Zambia and after the conference Enrico Calandro has been invited to lead a Telecommunications Policy publication special edition on the Global South. In addition to AfriNIC, new research partners have collaborated with RIA in different capacities and at the different stages of the research project, including Cambridge University, Queen Mary University of London and Anglia Ruskin University.

Last but not least, we plan to start a more active collaboration with the global agency, M-lab (Measurement Lab) to develop methodologies on measurement broadband performance in Africa.

2.5 Open access broadband networks in Africa

A study of open access broadband networks in South Africa, Nigeria and Kenya. The objective of this study was to understand the existing open access mechanisms in place, or to be implemented in each respective country; critique the existing mechanisms based on an assessment of broadband delivery in their respective markets; and make policy recommendations based on a draft framework aimed at (further) encouraging fair, non-discriminatory, reasonably priced and transparent access to broadband infrastructure. The project hoped its findings and recommendations would influence the direction of broadband policy so as to reach universal access objectives.

The research on open access seeks to understand under what conditions can the application of the principles of openness contribute to the successful deployment of next-generation access (NGA) networks to overcome lags in broadband uptake in three jurisdictions in Africa in ways that enhance affordable access and lay the foundation for the development of higher level open systems of innovation and content development - where concepts of openness arguably have been more coherently developed and applied - open source, open content, open data?

The launching of a policy brief for the mobile sector on wireless open access networks (2016) was used to communicate the study's open access model and findings to the media, where received attention amidst the public's critique of the wireless open access network proposed in the Integrated

ICT Policy White Paper released by the Minister of Telecommunications and Postal Services. This was followed up with by releasing the integrated policy paper on open access in South African and Nigeria. The South African case was presented at the 2016 CPRsouth conference and subsequently turned into academic paper written for the Telecommunications Policy journal.

Outputs and challenges

South Africa: The research engaged with the public critique of open access principles contained in the Integrated ICT Policy White Paper. The level of interest and attention it attracted was good but the effort ultimately failed to deter the desire for a wireless open access network by the Department.

Leadership on the project changed, the handover of which took some time. Thereafter, the arranging of an interview government actors was difficult. Responding to invitations is delayed and can only be successful if sent from the right desk: lower-level researchers are unlikely to be successful in getting time with high-profile public officials.

Coordinating contributions from country partners was complex as the research appeared to be happening on different level – conceptual understanding and research quality were unsynchronised. Making sure the Kenyan partner understood what was meant by “open access” and making sure the full conceptual meaning of the framework was carried into the interviews was challenging. As a result, Kenya's case study was inadequate and excluded. Several requests were made for improvement (including missing references) but none were supplied.

Papers

Gillwald, A., Odufuwa, F., Rademan, B. and Esselaar, S. (2016) “An evaluation of open access broadband networks in Africa: The cases of Nigeria and South Africa.” Available online at: https://researchictafrica.net/publications/Other_publications/2016_Integrated_Policy_Paper_-_Open_Access_Broadband_Networks_in_Africa.pdf

Telecom Policy paper: Gillwald, A. (2017) “Can open access regulation in developing countries deliver on public policy objectives of affordable access to broadband? The case of South Africa.” Telecommunication Policy, Africa Special Issue, Vol. # etc

CPRsouth paper: (2016) “Open access networks: driver or inhibitor of affordable broadband in South Africa?” CPRsouth 2016, Zanzibar, Tanzania. Available on request (paper not available)

Policy brief

Research ICT Africa (2016) “Do Open Access wireless networks threaten competition and investment?” Policy Brief No. 4, 2016. Available at: https://researchictafrica.net/polbrf/Research_IC-T_Africa_Policy_Briefs/2016_Policy_Brief_5_Open_Access_wireless_networks_in_South_Africa.pdf

Media coverage

TechCentral (2016) “Open access could backfire on gov't: warning”. Available at: <https://techcentral.co.za/open-access-could-backfire-on-govt-warning/68963/> (4 October 2016).

TechCentral (2016) “ICT white paper under fire”. Available at: <https://techcentral.co.za/network-nationalisation-slammed-as-huge-risk/69076/> (9 October 2016).

Gillwald (TechCentral) (2016) “Government's spectrum plan is unworkable” (written for TechCentral). Available at: <https://techcentral.co.za/governments-spectrum-plan-is-unworkable/69253/> (17 October 2016).

2.6 Public-private interplays in Africa's broadband sector

This research project consists of a study on public-private interplays (PPIs) in the respective ICT sectors of South Africa, Nigeria and Kenya, with a focus on broadband networks. The objective of this study is to understand existing PPIs in the identified countries; learn from them based on an assessment of ICT service delivery and access in their respective markets; and make recommendations based on a draft framework aimed at encouraging valuable, flexible and sustainable relationships between public and private actors for the purpose of enhancing ICT access.

2.6.1 Problem statement

After three decades of telecommunications reform globally that saw telecommunications shift from a monopolistic public utility model, to a largely liberalised and privatised sector in which investment risk was largely transferred from the public sector to the private sector, the state is again emerging as a key player in broadband strategies around the world as a relevant actor to address this problem. The scale of investment required to build-out next-generation networks means that even in developed countries, and particularly in developing economies, neither the state nor the private sector on their own are able to meet the broadband needs of countries in increasingly information-dependent economies. This reality calls for policy that understands the need for a new interplay between the state and market creating new access, service delivery, investment and business models.

2.6.2 Implementation and challenges

This empirical assessment of the changing patterns of public-private interplays has attempted to theorise about the changing nature of state and market relations in countries with limited state and regulatory capabilities and private sector investment capacity. It has undertaken an institutional analysis of the sector arrangements in Kenya, Nigeria and South Africa to determine what the optimal arrangements are under particular conditions for broadband to deliver on key policy objectives. Through high level interviews and comparative analysis, it proposes a policy and regulatory framework for the public-private collaboration in providing public or social goods.

Requiring interviews from a similar group of stakeholder as the Open Access project opened up the interview process to the same challenges in arrangement: responses to invitations were delayed, and can only be successful if sent from the right desk (lower-level researchers are unlikely to be successful in getting time with high-profile public officials). Without senior engagement high-profile public officials showed little interest in participating this time around.

Leadership on the project had to change and the new researchers took some time to get familiar with the project background. Thereafter, the coordination of contributions from country partners was again a difficult task until new researchers were appointed. Without collective agreement on the more fluid concept of PPIs researchers defaulted into the literature and practice of public-private partnerships that the research was specifically aiming move beyond. In an attempt to get a non-PPP infrastructure case, RIA with the former Mauritius regulator, Dr Krishna Oolun, who was responsible for introducing a cyber policy framework in Mauritius and saw the evolution of the framework into what can be described as a PPI.

Outputs

RIA is finalising an integrated report which is expected to contribute to the understanding of PPIs, their potential, strengths and weakness in an African context. RIA has conducted a strong and comprehensive literature review to contribute to the academic knowledge of the concept and a separate paper will be considered. The separate case studies are to be used in policymaking circles where the findings can be presented clearly and distributed to those in public office who could arrange more proper and efficient broadband deployment with the help of enhanced PPIs.

For the Public-Private Interplays project all three case studies were finally signed off providing interesting insights into the reasons for the failure of public-private partnerships in developing countries, and

interesting alternative public-private interplays. Amongst these is a fourth case study on the implementation of the cybersecurity framework in Mauritius which leveraged the skills and resources of the high developed financial sector in the country. This case study was used to as the basis for a panel at IGF 2018 on multistakeholderism and cybersecurity organised by Anri van der Spuy and Enrico Ca-landro. The panellists discussed collaborating models for cybersecurity through the Mauritius case. Prof William Dutton, Oxford Martin Fellow, The Global Cyber Security Capacity Centre, Mr Arthur Gwagwa, Senior Research Fellow, Centre for the Intellectual Property and Information Technology Law (CIPIT), Ms Koliwe Majama, Consultant, Association for Progressive Communications (APC), Mr Matthew Sheers, Director, Cyber, Global Partners Digital (GPD), and Mr Michael Nelson, Tech Strategy, Cloudflare, discussed the need for collaborative participation in cybersecurity policy development, and implementation. Some of the questions the panelists sought to answer related to how do collaborative models look in practice, and what is driving different them. The panelists agreed that multi-stakeholder collaboration is needed in cybersecurity policy development and implementation, and that the main challenge is to identify how to make it better. The summary of the panel, and the policy brief, are available at the following web-page: <https://researchictafrica.net/2018/11/08/igf-panel-discussion-on-collaborative-models-for-cybersecurity-the-mauritius-case/>

2.9 Digital Financial Inclusion

Financial inclusion refers to all initiatives that make formal financial services available, accessible and affordable to all. Access to finance is critical to the welfare of individuals and the development of informal and micro-businesses. While most of the African community has been financially excluded in the past 10 years, the development of new financial media such as mobile money and the digitisation of financial services have increased financial inclusion in Sub Saharan Africa. The RIA After Access Survey conducted in seven African countries, Ghana, Kenya, Mozambique, Nigeria, Rwanda, South Africa and Tanzania, shows that only 32% of the population, aged 15 years and above, have access to financial services. It is therefore critical to understand factors that are inhibiting the rest from accessing financial services. Understanding factors that inhibit individuals from accessing these services is critical for building evidence-based policies that are likely to correct this divide.

2.9.1 Background

Research ICT Africa (RIA) continues to conduct surveys on ICT access and usage across African countries. The surveys, which date back to 2003, with the other waves of surveys conducted in 2008/9, 2011/12 and the recent 2017 RIA After Access survey, collect information on household and individual access and use of mobile phones, fixed lines and Internet. While the previous studies focused on adoption of mobile phones and fixed lines, the 2017 RIA After Access Survey focused on broadband access and use.

Piggy-backing on the household and individual survey, RIA also conducted an informal business sector survey among the enumeration areas surveyed. While the household survey is nationally representative, RIA cannot claim representativity in the informal business survey. However, the informal business survey gives an indication of access to, and use of telecommunication services.

Even though the surveys are focused on telecommunication access and usage, they also collect individual information on access to financial services and the use of value added services such as mobile money, mobile banking and Internet banking. These measures are important in helping governments, policymakers and stakeholders to develop financial access metrics, and also in the understanding of factors that could be inhibiting those who do not have access.

- ❖ Deen-Swarray, M., Moyo, M. and Stork, C; (2013) ICT access and usage among informal businesses in Africa, Emerald Group Publishing Limited, info-05-2013-0025, ISSN: 1463-6697, info, Vol. 15 Iss: 5.

- ❖ Stork, C., Deen-Swarray, M., and Ndiwalana, A. (2013): Mobile Money and the informal business sector in Africa: Bridging the financial gap, CPR Africa / CPR South 2013.

From a financial inclusion perspective, a large body of existing research focuses on whether people have a financial account or mobile money, with less focus on whether households, individuals and businesses have access to loan facilities in case of smoothing consumption or investment purposes.

A combination of the historic survey data collected by Research ICT Africa, and the 2017 RIA After Access Survey in analysing developments in the financial services and how they relate to society, is critical to policymakers and regulatory authorities for ensuring universal financial access. A lot of work, however, is yet to be done in this area, including assessment of how new digital product/platforms such as microwork/ digital gig impact on financial inclusion. Most work which is based online requires workers to have a bank account, and overlaying the microwork data and financial inclusion data will be a valuable exercise. Furthermore, to understand financial inclusion across different locations (urban/rural), the RIA After Access data will be combined with satellite data, nights light intensity, which allow us to map financial access indicators across surveyed located in Africa.

2.9.2 Problem statement

Despite a number of organisation such as the IFC indicating that innovation in both the mobile sector and the Internet sector has increased financial inclusion in developing countries, majority of people in the developing countries are still financially excluded. The 2017 Research ICT Africa Survey shows that only a third of people above 15 years old have access to a bank account.

Studies that consider the impact of digital finance on inclusion only focus on issues relating to adoption, while the degree of inclusion remains unknown. For instance, while mobile money financial services allows users to make financial transactions such as sending/receiving money, their access to insurance and loans remains a subject of research.

Understanding financial inclusion goes beyond adoption and access of platforms that one can use to transact, but whether business and individual have access to loans in case of need for investment or consumption smoothing. This project intends to fill this gap by combining a number of available data sources with the survey data to assess how developments in the financial market have impacted societies.

2.9.3 Implementation and challenges

The digital financial inclusion project used data that was collected by Research ICT Africa across 10 African countries, Ghana, Kenya, Lesotho, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania and Uganda. This data was combined with other data sets, for instance Research ICT Africa collaborated with Cenfri and mapped the survey data to platforms that are operational per country.

Generally one of the survey challenges comes from working with national surveys as they take long to provide the necessary information required to conduct a nationally representative survey. On the other hand the low levels of Internet penetration in Africa, meant that when dealing with Internet based platforms one has to work with restricted sample (small sample).

Outputs

The deliverables of the digital financial inclusion include:

- ❖ Building a dataset that combines survey data with other data sources: satellite data (nights light intensity);
- ❖ Interactive portal showing financial inclusion indicators across countries;
- ❖ Country reports;
- ❖ Policy papers;

- ❖ Comparative reports; and
- ❖ Peer reviewed papers.

Below is a list of the findings and recommendations from each policy brief released in 2017/18.

Policy paper: Mobile money and financial inclusion in Sub-Saharan Africa

- ❖ Majority of people in the surveyed countries do not have access to a bank account. Only 32 percent have their own bank account, while 4 percent use someone else's account.
- ❖ An assessment of those who are able to transact, that is those who have a mobile money account and a bank account, the proportion of those who are financially included increases to 45 percent. However, majority of these people who are able to send or receive money do not have access to loan facility and insurance.
- ❖ Mobile money is common in countries that do not have well developed financial services. Residents of countries that have well developed financial services are more likely to use Internet banking services and mobile internet banking platforms than mobile money services.
- ❖ The use of mobile money is common across the poor and the rich, with families that have someone living in another location likely to use mobile money platforms to send/receive money rather than use a banking account.
- ❖ Though mobile money users, who are mostly individuals at the bottom of the pyramid, are able to send or receive money, they are financially excluded in the credit market. This is despite innovations in the market such as M-Shwari.

2.10 The state of micro work in Africa

Africa has traditionally been characterised by stark barriers to economic growth such as unemployment, lack of infrastructure and penurious communication and flows of information. In the past decades, Africa has seen an exponential growth in mobile phones, with more than half of the population owning a mobile phone. Heavy investment on high speed fibre-optic cables to improve international connectivity allowing the continent to tap on Internet-fuelled economy.

While many African countries have made significant progress towards creating an Internet driven economy by promoting broadband sectoral reforms and focus on increasing broadband availability, Internet's contribution to gross domestic product (GDP) in Africa is low relative to other developed and emerging economies. In 2012, the Internet sector contributed about 4% to developed economies but only contributed a percent to Africa's GDP³. As shown above, Internet access infrastructure is no longer the roadblock to Internet. Some countries such as Rwanda and South Africa have invested heavily on infrastructure with Rwanda's 4G/LTE coverage having reached 95%. Internet use is very low in Africa with some more than 90% of the population not using the Internet in countries such as Rwanda and Tanzania.

Digitisation and networked communications are increasingly touching all aspects of modern life and all sectors of the economy. Among them is employment, which has served as a key organising principle for society since the industrial revolution. Currently, several forces are reshaping traditional employment and more generally how labor markets operate. On one hand, advances in artificial intelligence in combination with modern robotics are threatening to automate jobs that were previously considered too complex for non-human execution. On the other hand, online labor platforms facilitate the unbundling of work into smaller tasks that employers can contract out to freelance workers around the world.

³ <https://www.internetsociety.org/resources/doc/2017/africa-internet-economy/>

The 2017 RIA After Access Survey focused understanding the participation of African labourers on the online work or microwork platforms. Microwork entails splitting a large job into small tiny manageable pieces of work and allocating them to a large number of workers using an Internet-based platform. Microwork is characterised by online forum participation, data input, image tagging, that are usually quickly performed and require no specialised skills. Usually, workers are paid small amounts of money for each task. High adoption of Internet enabled devices have led to some platform developers focusing on micro-tasks which can be performed on mobile phones.

2.10.1. Problem statement

As the mobile phone industry continues to scale rapidly with more than 50% of the African population covered by mobile phone technologies. Migration to higher speed networks and smartphones continues apace, with mobile broadband connections set to reduce the historical digital divide created by high cost fixed-line infrastructure. Internet penetration in Africa remains low (28%), with less than a third of the population accessing the Internet. The low Internet use in Africa remain a barrier for African to participate on virtual jobs. The 2017 RIA After Access Survey shows that there is a very little uptake of micro work in Africa, with only two percent of the population among the surveyed countries doing micro work jobs. Among the 29 percent that use the Internet in the surveyed countries, only five percent are micro workers.

Majority of micro workers do data entry and completion of surveys (26%), while 22 percent do laundry and cleaning services. A significant proportion also do shopping and delivery of household items while a few work in the E-hailing application.

The uptake of these platforms is not only likely to create jobs but will also increase financial access as most of these platforms require their employees to have bank account. Outcomes

Outputs

- ❖ Research ICT Africa collaborated with Cenfri to bring together a number of data sources which will help in developing financial inclusion indicators across countries. The existing database contains information on platforms that are providing the a link between suppliers and customers, information on whether the application was developed in locally and where the application is used. The supply side data is mapped on the country demand side data to understand the characteristics of users and evaluate whether these platforms have any impact on financial inclusion.
- ❖ The micro work paper was presented at the CPRsouth conference in Mozambique in September 2018⁴.
- ❖ A stakeholder meeting in collaboration with the Oxford Internet Institute was hosted in Johannesburg., South Africa, and was attended by Uber drivers, Taxify drivers and other micro workers.
- ❖ Africa Digital platform-Expert Workshop will be hosted on the 29 November 2018, to present the initial findings of the mapped micro-work supply and demand-data. The workshop will be hosted in Cape Town, in collaboration with Cenfri.
- ❖ Supply and demand-side micro-work and financial inclusion brochure which maps financial and micro-work gender and location gap across all the surveyed countries.
- ❖ Presentation of the microwork and financial inclusion at the Africa eCommerce Week, 10-14 December 2018. The conference will be hosted in Nairobi, Kenya under the theme empowering African economies in the digital era. The conference aims at examining ways to enhance the ability of African countries to engage in and beefier from e-commerce.

⁴ https://researchictafrica.net/wp/wp-content/uploads/2018/10/After-Access_The-state-of-microwork-in-Africa.pdf

2.11 Rapid Response

2.11.1 Zero-Rating

Project description

The Zero Rating project focused on a supply-side assessment in Kenya, Ghana, South Africa and Nigeria in the context of Over-the-Top (OTT) services and net neutrality. The purpose of the research was to determine the extent of zero rating in Africa and the policies and regulations that may be developed in response. This followed the global debate on the anti-competitive outcomes of zero rating of data for OTTs, and alignment of effort by telcos and certain activists to have them regulated. The research objective was to provide a supply side assessment of this issue by assessing the products offered in selected African markets, in this case Ghana, Kenya, Nigeria and Rwanda.

Output

In 2015, the zero-rating work has focussed on understanding the context in Africa when it comes to zero-rated products. This came into light following the launch of free-basics by Cell C in South Africa during international debates on whether this does not infringe on net neutrality. A policy paper was written by Alison Gillwald, Chenai Chair, Ariel Futter, Kweku Koranteng, Fola Odufuwa, and John Walubengo. The policy paper examines the issue of zero-rating within the context of the range of discounted and dynamically-priced African mobile network operator (MNO) products, and the priority public policy issues facilitating the continent in relation to the internet.

Overall the report found that from the operators' perspective zero rating is one of many other pricing strategies used to entice and retain data users in the very dynamic prepaid mobile market. Policy makers and regulators have adopted a 'wait and see' approach on zero rating and violation of net neutrality. The report recommended an innovative approach to policy making with regard to this area.

RIA served as a friend of Parliament in SA when it held public hearings on OTTs early in 2016. The Executive Director was subsequently interviewed extensively in the media and was a guest on the hour-long chat show on South Africa's public broadcasting flagship channel, SAFM. Podcasts of SAFM with Sakina Kamwendo can be found at <http://iono.fm/e/249387>

Publication

Policy paper: Gillwald, A., Chair, C., Futter, A., Koranteng, K., Odufuwa, F. and Walubengo, J. (2016). Much ado about nothing? Zero rating in the African context. http://www.researchictafrica.net/publications/Other_publications/2016_

2.11.2 Ethiopia privatisation policy paper

The final rapid response project was the preparation of background public policy paper in response to the announcement by the Government of the Free Republic of Ethiopia of the intended privatisation of Ethio Telecom around which there has been intense interest and discussion. Ethiopia has long resisted the reforms that saw first the mobile and then broadband revolution in other African countries. The privatisation will not only address the debt burden the state-owned enterprise but also creates a dynamic ICT ecosystem, that in turn creates more jobs and innovation. The policy paper by long-standing Ethiopian RIA partner, Dr Lishan Adam warns that privatisation alone is not sufficient to bring about telecom sector improvements. Drawing on the now extensive empirical evidence form around the world and in Africa he demonstrates t that a series of activities should accompany the announcement to privatise the incumbent operator. Most significantly for an innovative valuation and long term value fo the country is the proper sequencing of regulation, competition and privatisation.

He identifies the main ingredients of successful privatisation as including:

- ❖ ongoing communication of the objectives and the process of privatisation to ensure that it is transparent and accountable to the public, private sector and the Ethio Telecom employees;
- ❖ putting complementary policies that drive the privatisation process and liberalisation of the sector in place,
- ❖ restructuring of the telecom company;
- ❖ introduction of competition in the different segments of the telecom market, and
- ❖ establishment of an independent regulatory agency and regulatory capacity building for the regulator and decision-makers.

2.12 Capacity building

2.12.1 Doctoral programme on The Digital Economy and Society

The intention of the programme is to nurture policy intellectuals able to engage critically with national, continental and international public-policy processes emerging from the evolution of the Digital Economy and Society in Africa. The strategy to achieve this was to build supervision and doctoral capacity at the Lagos and Nairobi Business Schools as well as the University of Cape Town, where Professor Gillwald was already supervising students the Nelson Mandela School of Public Governance. So far, three doctoral students have graduated, one student is in his third year.

Unfortunately, during the first year of the grant as we tried to identify supervisors at the three universities LBS put a moratorium on doctoral registration until it has addressed its supervision shortage and the NBS could not find ICT policy and regulatory specialists to supervise students in the area. Using the under-utilised student and supervision funds from the two institutions, six students from LBS, NBA and UCT, together with others that had applied from other institutions were brought together at UCT for research and methodology workshop facilitated by senior Nelson Mandela School of Public Governance staff to provide them with the kind of support that students gaining entry to many developed countries would get.

Over five days the workshop covered research design technique and methodologies that were applied to the students preparation of a proposals that would meet the threshold level of a first tier African university such as UCT. The intention was to assess at the end of the workshop who would be able to proceed with a PhD and to identify specialist co-supervisors with Prof Gillwald. Of the six students, four had developed their proposals sufficiently developed to register. One is studying the governance of multi-sided markets in platform economy in mobile markets in Africa; another blockchain as a technology to enable more transparent and accountable public sector delivery; the third is assessing the demand side aspects of microwork/work in the gig economy; and the other is examining the cyber-policy framework required to create a trusted environment for digital takeoff.

The five new PhD candidate derive from our capacity building and intellectual engagements that reflects the strength of our networks. They have been engaged through the following established partnerships/programmes:

- ❖ Lagos Business School. The student was a country partner researcher on policy and regulatory projects
- ❖ Two students attended CPRsouth young scholars programmes and subsequently applied for admission
- ❖ ITU regional office: The student is a senior programme officer
- ❖ Researcher from RIA, whose MA research we supported, prior to her becoming an intern and researcher

These candidates will build on the two that have graduated under Prof Gillwald's and one under Prof Time Waema's supervision using the RIA household data supervision through the Amy Mahan the one PhD that is still in process. The candidates topics are focusing on digital inequality and governance in platform/gig economy

One of the strategies to fund the MD/ED post, is for the supervision of the doctoral programme to be more formally funded by the university and/or national research grants. The securing of the professorship by the Executive Director, first at UCT Graduate School of Business which was then transferred to the Graduate School of Development Policy and Practice (GSDPP) was the first step to achieving this. As things stand this is a non-remunerative adjunct professorship, though over the last two years there has been limited funding for supervision as part the development of high level capacity in Kenya, South Africa and Nigeria (Broadband4 Africa programme). The intention with the appointment is that the exit subsidy paid to the university on graduation is used to support the part-time appointment at the university of a professor who will have an additional function within GSDPP to coordinate and house various ICT siloed initiatives on campus (from ICT4D to Big Data) into the trans-disciplinary programme of the School (and the doctoral programme). GSDPP applied for this grant in order to support the PhD supervision but the outcomes is still not known.

In addition RIA will seek multiyear doctoral funding from IDRC and SIDA both of which have longer term grants for this purpose.

Professional Development

RIA was to have conducted a professional development workshop on key areas arising from the research for policymakers and regulators. Three seminars which could be integrated into a three-day course but could also be attended individually, were tagged onto the ITU Telecom 2018 which was held in South Africa. Drawing on our research findings and collaborations three topics and faculty were identified and advertised — Developing reliable indicators; Cybersecurity and human rights; and Alternative access strategies, innovative spectrum use and community access. The funds from this grant were to pay for the course development, the time of faculty and the flights of a few that were not intending to be at ITU anyway and some bursaries. There was interest in the course but not necessarily from people who would be attending ITU, though we did get one or two of those, but overwhelming regulators indicated they did not have funding to attend the course and with less than 10 people signed up for each the course was cancelled. Some of the funding of the course was transferred to ensure the African School of Governance 2018 went ahead, and which was offered in Zanzibar by the Association of Progressive Communication and RIA in Zanzibar prior to the African IGF.

We have been building relationships with the African Union and SADC to funnel our research into their work programmes, conferences, piggy-backing our events and training on their captured audiences. This seems to us a far more likely way of getting capacity building which has been so important to our research to policy influence undertaken in future.

3. Partnerships and collaboration

3.1 AfriNIC

In June 2017, at the Africa Internet Summit in Nairobi Kenya, RIA and AfriNIC formalised their collaboration and signed a memorandum of understanding (MoU) to collaborate on Internet-related research topics. Those include, amongst others, broadband performance, the transition to IPv6, surveillance and cybersecurity. The research collaboration between the two institutions emerged out of a mutual understanding that there is a need for individuals and organisations working for an open and accessible Internet to move from working in silos to working together.

Given that AfriNIC is home to a technical community focusing on the systems comprising the Internet, AfriNIC identified a need to engage with RIA in order to better understand issues affecting end-users as well as the policy and regulatory processes that might fly under the radar of technically orientated research agendas. Building a body of empirical evidence on technical issues as well as conducting supply-side and demand-side assessments from this collaboration would better inform policymakers.

The partnership is important not only from a research perspective, but also from a policy influence perspective, as AfriNIC is the main African body in charge of setting standard rules on IP numbers, and more broadly on policy issues affecting the development of the Internet in Africa.

One of the first research project on which the organisations are collaborating is broadband performance. The main achievement from a policy influence perspective is that broadband performance is now one of the main research areas of AfriNIC, and a systematic approach to the collection of broadband performance evidence has been adopted.

AfriNIC, in conjunction with Research ICT Africa ran its first workshop on Africa Internet Measurements on 30 May 2017 during the Africa Internet Summit 2017 (AIS '17) held in Nairobi. The workshop engaged in discussions around mechanisms and challenges in measuring Africa's Internet, drawing seventy (70) participants including network operators, regulators, civil society, researchers and NREs. We had several presentations from Internet researchers from around the world focussing on Africa's Internet ecosystem.

3.2 RANITP

Since January 2017, Research ICT Africa has been hosting the Regional Academic Network on IT Policy (RANITP), a programme led by UCT Graduate School of Development Policy and Practice (UCT GSDPP) and Research ICT Africa (RIA). The project aims at promoting high level multidisciplinary research on ICT policy across the African continent, and the current phase is focused on providing the necessary evidence to inform policy processes on the implementation of cloud computing services in the public sector. For this purpose, RIA organised a full day workshop in Nairobi Kenya, on 31 May 2017 to participate in the research design process. The other institutions involved in the project include Lagos Business School, University of Nairobi, University of Zambia, and University of Ghana Business School.

All research institutions involved in the project have almost completed their research and their preliminary results have been presented during the Outside Council Network/RANITP Summit, hosted at the Policy Innovation Centre of Strathmore University, Nairobi, in November 2017.

3.3 CPRsouth

RIA handed back the secretariat to LIRNEasia with some commitments to continuity in funding being provided by IDRC for at least another two years. LIRNEasia organised an excellent meeting in Myanmar, working with their local partner NGO Mido. They have been working intensively on the reform programme in Myanmar and several high level officials were present, including the director general. Several of RIA's papers, some quite good, were presented at the conference and some were subsequently accepted for publication in peer reviewed economics journals. Two papers co-authored by RIA Executive Director, one with Christopher Geerds on public wi-fi and one critiquing international ICT indices with Christoph Stork and Steve Esselaar, both tied first for best policy brief. Both the Executive Director, and Christoph from RIS were identified by the chairperson, Rohan Samarajiva, as having the highest scores as discussants in the conference evaluation. Mothobi Onkokame also managed to secure a place on the Young Scholars Programme and did RIA proud with his inputs both in the Young Scholars Programme and in his critique of papers in the main conference. The Executive Director also gave a lecture on the Young Scholars Programme and advised some young scholars on their research, resulting in an application of one of them to shift their PhD to UCT having been unable to secure a supervisor at his university in Ghana.

The conference was followed by a training programme for the regulatory unit which is still in the Ministry, which although not pitched at the right level for attendees, was successful. Our faculty included other former regulators and African members of the CPRSouth board, Dr Krishna Oolun and Dr Monica Kerrets-Makau. The Executive Director engaged in depth with senior officials who wished to know about further training opportunities and peer engagements with regulators in Africa, and particularly South Africa. LIRNEasia and RIA have done joint training in the past and the course highlighted the synergies and sharing that cross-over Africa-Asia training programme can have.

RIA will assist LIRNEasia with organising the 2018 conference in Mozambique to be co-hosted with the regulator, INCM, and chairperson Dr Americo Muchanga.

4. Consultancies/technical assistance

IDRC funded projects were leveraged for wider technical assistance and policy influence and they have been part of co-funded initiatives.

4.1 World Bank: Zambia ICT gap analysis

RIA was commissioned by the Government of the Republic of Zambia and the World Bank. It drew in RIS to assist with the project and Tina James for the initial gender component. The purpose of the report was to pinpoint gaps in the ICT sector and to identify recommendations which address these gaps. The recommendations were informed by the trend away from voice and SMS revenues towards data revenues and Over the Top (OTT) services. OTT services are replacing traditional voice and SMS communications, upending traditional business models and creating new opportunities for services and applications. The trend towards data-intensive applications and OTT pricing models means that if Zambia wants to take advantage of the benefits of the information economy, it needs to focus on ways to extend broadband access to the entire population, and to provide strategies that enable increased ICT usage. Benchmarking Zambia against Kenya, Tanzania, Uganda, Namibia and South Africa and in terms of affordability, access, usage, infrastructure and competition showed that Zambia had high prices; was lagging significantly behind other regional countries in terms of mobile broadband adoption; high corporate taxes discourage investment, leading to poor infrastructure scores and therefore poor access and usage; high regulatory levies - even in the proposed new licensing regime - discourage investment and innovation, and penalise network service licensees unfairly; and there is a significant urban-rural divide with 85 percent of households in urban areas have access to a mobile phone, compared to 50 percent in rural areas. The diagnostic approach is extended to ICT sector governance and views the ICT sector as an ecosystem of dynamic national governance institutions, markets, operators and citizens. The chapter on ICT sector governance finds that: ICT policy is outdated and unable to provide strategic direction in a converged global environment that is moving quickly towards data-only services; there is a substantial disconnect between policy development and implementation strategies. Policies are publicly released but implementation strategies are confidential, or limited to a small circle of key players and never move beyond draft form. The purpose of the recommendations is to provide a framework for the World Bank and its partners to assess what programs would have the largest impact on the ICT sector. Consequently, the recommendations were tailored to have the greatest impact, taking into account the Zambian political economy, and whether these programs are implementable within current institutional and wider resource constraints. They included introducing Freemium Internet, Deploying the Universal Service Fund for the development of free public Wi-Fi networks in Zambia has the potential to bring more people online, improving government communications online with citizens, and reduce digital inequalities, which are the direct result of the lack of affordability. Governments in the region, such as Uganda, are already experimenting with this model, offering free Internet access from 6 p.m. to 6 a.m. every day from government buildings; lowering corporate taxes, specifically for the telecom sector; reduce regulatory levies, especially proposed licensing fees; Implement a unified licensing regime; lower mobile specific taxes, particularly

those on usage; and develop spectrum guidelines that recognised the dynamism of the mobile market.

Paper: Chair, C. Gillwald, A., and Hazbeenzu, S (2017). Zambia focus group report: Gendered assessment of internet use and data savings. Prepared for the World Bank (unpublished).

4.2 World Bank gender ICT gap analysis

This report was commissioned by the World Bank and follows on from Information and Communication Technology (ICT) and gender gap analyses undertaken in 2016 by Research ICT Africa for the Bank and the Government of Zambia. The purpose of the study was to pinpoint gaps in the ICT sector and to identify recommendations that address these gaps. It drew a strong link between the affordability, accessibility and use of ICTs and the services and applications that can make a difference to the lives of all Zambians.

A qualitative research approach was used as it can tease out some of these more nuanced gender issues in relation to cultural and social issues. The focus groups were stratified according to gender - men only and women only group - and by location - urban, rural and peri-urban. With training from RIA, the groups were undertaken by RIA's country partner, Shuller Hazbeenzu and members of the Bureau of Statistics Gender Unit who had experience on similar research and gender issues.

4.3 ITU Uganda Government: Network readiness for Digital Uganda Vision.

The ED was commissioned by the ITU to undertake a readiness assessment for the very ambitious Digital Uganda vision supported directly by the Indian presidency. As the project drew extensively from the Digital India project it did not sufficiently take into account the very different conditions that pertain in Uganda. The digital readiness enabled some retaining on some critical issues and by directing some of the additional funding received from SIDA for additional ICT access and use surveys we were able to add Uganda to the Afer access counties. Working with the regulator and the Ministry we were able to make some important demand side inputs subsequently but clearly not enough to persuade the Presidency not to impose social networking and mobile money taxes, though we have been able to use the demand side data in several international fora to demonstrate the regressive nature of them and the negative impact on the poor. Blogs and policy papers have been produced to demonstrate how they undermined the Digital Uganda Vision.

5. Communications and evaluation

In 2013, IDRC contracted the Digital Environment for Cognitive Inclusion (DECI) team to work with RIA on an evaluation of a decade of funding RIA and the impact of their research to policy work to look forward and prepare the ground for future activities. The main output of that collaboration was RIA's established and effective Theory of Change (ToC). The ToC was updated in 2016 to reflect external and internal organisational changes. As ToC is a process, rather than a product, the approach has been updated and revised with the implementation of the communications and evaluation strategies during 2017 and is in the process of being operationalised in 2018. In the revised 2017 ToC (see Annex 3), communications and evaluation processes are iterative at all levels of the ToC to maximise internal and external visibility and therefore cyber policy impact.

5.1 Communications

5.1.1 Problem statement

Using the IDRC sponsored DECI mentorship programme the Communication and Evaluation function was formally established within RIA in June 2016. The communication strategy was previously rather intuitive and not formalised, and dependent on the activity of the executive director. The strategy now focuses on RIA's networks and hubs of influence as well as opening pathways for RIA to build strategic relationships with governments, donors, public policy experts, and other key partners. The pur-

pose of having evaluation in house is to improve efficiency and effectiveness of projects, build capacity in terms of reviewing project logic, and influence the communications strategies based on the project purposes aligned with the overall RIA purpose. While previously it was a function conducted through external evaluation, having this function in house improves RIA project development and delivery. However, as the evaluation section highlights, the implementation at this stage relied on an external process in building capacity.

5.1.2 Implementation

DECI has found that for research organisations, because the communications strategy is derived from the ongoing evaluation process, having a researcher perform this function is the most effective. Researcher, Chenai Chair, was therefore appointed on a 50 percent basis to the C&E position and she has made great strides toward integrating these into RIA's practices very rapidly. To ensure efficient communications strategy, an internal and external strategy have been developed. Internally, the purpose of the strategy has been to build capacity for all researchers to develop communications strategies at a project level aligned with the overall RIA process. The first step to this was through an internal workshop attended by all staff discussing the approach to communications. From there on, the communications manager has worked with staff in development and implementation of communication strategies.

To ensure efficient communications strategy, an internal and external strategy has been developed. Internally, the purpose of the strategy has been to build capacity for all researchers to develop communications strategies at a project level aligned with the overall RIA process. Internally a communications workshop was conducted with the RIA team on developing a communication strategy aligned with RIA's overall purpose. Follow up individual meetings with project leaders have been conducted to assist in developing project strategies. For external communications, the communications strategy is being developed through the process of identifying and unpacking the key purposes of RIA, then identifying the audience, followed by objectives matched to audience and purposes. This then followed by method of communication. We also make use of the RAPID response approach where we seek to maximise on windows of opportunity with relevant research packaged in an easily accessible way. Methods of communication are mainly the RIA website, social media platforms, mailing list development, reliance on networks, attending face to face meetings, write ups such as policy briefs, blogs and reports. These are captured in the outcome mapping report.

The After Access global communications campaign provided a new cooperative communications strategy that aimed to nurture the development of After Access as global south brand highlighting the survey work done by RIA, LIRNEAsia and DIRSI. A communications agency organised the communication strategy, however the communications manager oversaw content to be used as well as social media implementations.

Outputs

RIA launched a new website layout in September 2017. The purpose behind the redesign was to have an easier, interactive site for the users and for self-management. The design was meant to communicate the overall RIA brand and carry relevant information that is often overlooked such as the fact that we are a not for profit organisation. The website, in the communications strategy, is our main hub of content and channel of communication to our wider audience. However, the unique number of visitors is declining over time. This is likely due to the limited content that has been published thus far and perhaps users gaining RIA information through social media (Figure 1). The country sector reports from the surveys remain the most popular downloaded material therefore we expect a change in trends once the reports have been published (see Table 1).



Figure 1: Unique visitors to the RIA website from September 2017-August 2018.

Table 1: RIA top-10 popular downloads		
Downloads	Hits	206 Hits
Kenya Vision 2030	6 493	8 184
Evidence for ICT Policy Action: Policy Paper 7 – Understanding what is happening in ICT in South Africa	4 716	2 601
Evidence for ICT Policy Action: Policy Paper 9 – Understanding what is happening in ICT in Kenya	2 689	3 036
Evidence for ICT Policy Action: Policy Paper 3 – Understanding what is happening in ICT in Ethiopia	2 448	5 645
Evidence for ICT Policy Action: Policy Paper 20 – The cloud over Africa	2 339	529
National Information Technology Development Agency Act: 2007 (Nigeria)	2 278	974
Strategic Analysis of the Telecommunication Sector	2 235	2 541
Public Wi-fi policy paper: Developing Smart public Wi-Fi in South Africa	2 189	4 788
Ghana Electronic Transactions Act (2008)	2 137	2 456
Cost to South African Parliament	1 889	34

In response to queries from our audience on where they could get aggregated RIA news and from an audience analysis conducted with different stakeholders, we migrated to a centralised mailing plat-

form. The platform is a means of sharing RIA data rather than a way to engage on RIA topics- one way communication. We integrated the sign up form to our social media platforms, our new website and on our personal email signatures. The growth of the mailing list is based on imported subscriptions and hosted form sign up. In the last year, 52 percent growth of subscribers has been organically (see Figure 2). The purpose of this platform has been raising RIA's visibility with an objective of keeping our up to date with RIA activities and a more visually appealing email format.



Figure 2: Mail Chimp Audience growth in the last year

Source: RIA mailchimp dashboard

The social media sites have been used as a complimentary to sharing information posted on the website, engaging on trending topics, responding to windows of opportunity and gaining a diverse audience for RIA's work. Our social media communications generate organic audiences against paid for audience, therefore we often compete with organisation with paid for information. Social media, as a communication channel, allows for snap shot insights into RIA work and real-time engagement on specific issues. Our social media accounts stand at:

- ❖ Facebook: 3,441 followers and 3437 likes
- ❖ Twitter: 1,693 followers

On our Facebook page, our biggest audience is from Ghana, followed by Mozambique, South Africa and then Zambia Our reach, according to Facebook analytics is mainly within a few African countries. Facebook does generate a wider audience, but the challenge is in engagement of the work.

While on the twitter platform our top audience is located in South Africa, United States of America and the United Kingdom. We draw in an audience interested in business and technology news, business and finance and political and current affairs. The twitter platform has also served as a means of quick engagement during conferences and events and a means to draw the debates to the RIA data available. As part of the After Access global communications, the RIA twitter account was used to highlight and validated the After Access social media platform. As part of the cooperative communications strategy, we were able to highlight the localisation of the research as well as the global reach.

Outcomes

The use of social media as a complimentary medium to the content on the website provides a quick response to current affairs as well as referral to our work by other RIA champions. For example, INASSA ran a twitter campaign highlighting the After-Access work.

5.2 Evaluation

5.2.1 Implementation

The evaluation was implemented by the SADC Research Centre evaluation unit with assistance from Chenai (evaluation advisor). It was conducted as an assessment of the Broadband 4 Africa project phase with two purposes in mind:

- ❖ Evaluation of the opportunities and challenges for BB4A
- ❖ Theory of change operationalisation.

The methodology in data collection over the last nine months included an audience analysis of partners and users of RIA data, content analysis of RIA coverage, projects assessments by RIA staff members and an internal workshop to develop the theory of change. Theory of Change (TOC) was more clearly articulated through discussions with the research and operational team, a workshop and a review of programme documentation, following the assessment of BB4A.

Outputs

A final evaluation report is being developed. This highlights the successes and challenges of the BB4A project in its entirety and the sub projects assessed. The Theory of Change is also outlined in the final document with the objective being to identify pathways that enable RIA to achieve its goals – the operationalisation. The development of the TOC has been, and continues to be, a participatory effort. It was updated again for RIA strategic planning in October 2018, and is currently as reflected in the addendums below.

Outcomes

As a participatory evaluation the intentions was to develop evaluation metrics to be implemented on a project by project basis. The frequency of project evaluation will be developed from the recommendations. The TOC outlines how RIA intends to achieve its goals, and can thus re-evaluate strategies periodically to decide if the approach taken is leading to the intended outcomes, and in turn if the intended outcomes achieve the desired goals. RIA will be working on developing this framework with DECI at a workshop in November 2018 in Cape Town

5.3 Credibility and influence

RIA has arguably greater influence on global platforms than in any one African country, or continentally. Critically engaging in these fora was identified as a way of engaging directly with dominant epistemic communities and shifting that dominance over African policy making a regulation by providing viable alternative perspectives. The RIA networks within Africa are a clear part of the process for policy change as are the collaborative RIA sister networks in other regions: DIRSI and LIRNEasia. RIA is collaborating with Internet Governance@FGB on various CyberBRICS initiatives. This builds on an increasingly active engagement with Brazil on data collection (CETIC) and Internet Governance. RIA has maintained working relationships with various other specialist organisations, such as UNESCO, Privacy International, the Network of Centres, the Oxford Internet Institute, where the ED sits on the Advisory Board of the Geonet project. RIA has been able to engage with many players in the Internet governance space which led to be selected for the IDRC call for regional cyber-policy think tanks. We have also established a connection with the Peking University Centre for African studies which result in the ED being invited to the annual state sponsored International Relations conference to deliver a paper on digital rights and internet governance. She was also invited to give a seminar to some of the over post-graduate 100 African doctoral students study on bursary there.

5.3.1 Key Resource Person: ITU World Telecommunication Indicators Summit

Alison Gillwald and Senior Researcher, Dr Mothobi Onkokame, serve on the ITU Indicator Expert Group where Mothobi has been active, especially on pricing indicators. He participated actively in the Extraordinary Meeting of the Expert Group on ICT Household Indicators (EGH) and Expert Group on Telecommunication/ICT Indicators (EGTI) meeting held in Geneva in March 2017. At the ICT Household Indicators meeting, Mothobi presented a study on telecommunication indicators using survey data collected by RIA in Lesotho. The Expert Group on Telecommunication/ICT Indicators (EGTI) Meeting focused on the development of telecommunication pricing indices/baskets which was chaired by LIRNEasia colleague, Shazna Zuhyle. The group managed to adjust pricing indicators to

make them more appropriate to prepaid mobile markets by including data-only products and voice/SMS-only baskets rather than the previously proposed bundled services.

5.3.2 Key resource/keynote address: ITU Africa Region Economic Dialogue on Digital Economy

Alison Gillwald gave the keynote address at the ITU Africa region 2018 Economic Dialogue on Digital Economy in Burkina Faso in October 2018. The presentation and accompanying monograph drew extensively on the After Access data to explain the limitations and constraints on the emergence of a digital economy in Africa but also the potential of new technologies, drawing extensively on the insightful IDRC papers produced by Matt Smith on Artificial Intelligence and Raul Zambaro on Blockchain.

5.3.3 Internet governance

Alison Gillwald participated on five panels at IGF2016 in Joao Pessoa and convened the alternative policy and regulatory access and use panel with the African Union who attendance RIA sponsored at IGF. She participated in four panels at IGF 2017 which was held in Geneva in December, including one on BRICS, microwork, digital rights and the Global South #afteraccess panel which RIA has convened. She has just returned from the 2018 IGF where she presented the gender findings together with DIRSI and LIRNEasia. She also participated in Giganet and several other RIA panels mentioned below.

Chenai Chair served as one of the two course facilitators for the 2016 AfriSIG school and which Alison Gillwald served as a resource person. This participation furthered the relationship with APC which resulted in Chenai being invited to join faculty for the 2017 African School of Internet Governance. In 2018, RIA officially became one of the school's facilitators together with the African Union and the Association for Progressive Communications (APC).

Chenai also facilitated the gender and Internet governance exchange workshop held prior to the African School of Internet governance, and will also be conducting a workshop on internet governance with Access to Information Namibia (ACTION) in their road to setting up a national internet governance. Chenai was selected for ICANN NextGen, an under 30 leadership programme for ICANN 55 in Marrakech (2016) and went on to become a fellow at the ICANN60 meeting in Abu Dhabi. Chenai participates in the Africa at large structure and Non Commercial Users Constituency (NCUC). Through this, she ensured RIA was invited as a speaker for the NCUC out reach session at ICANN59 held in Johannesburg South Africa. She participated in the Paradigm Initiative Internet Freedom Forum where she presented on the state of Internet freedom in South Africa.

5.3.4 Appointment as associate editor to the ITU journal

Alison Gillwald was appointed to be an associate editor of the new ITU Journal: ICT Discoveries. The first volume on Artificial Intelligence built on the successful ITU AI conference last and the second volume focuses on Data for Good.

5.3.5 Invitation to join Canadian delegation to WTDC 2017

The executive director was invited to form part of the Canadian delegation to the World Telecommunications Development Conference in Buenos Aires in October 2017 and participate in the side event on Gender digital inequality, hosted by the IDRC and ISOC. The event was attend by the Canadian ambassador and several senior representatives of multilateral organisations including the ITU. The event and the entire conference provided an opportunity to profile RIA and particularly the high level indicators that we had from the #AfterAccess Survey. IT was also an opportunity for RIA to network with continental and regional organisations, and national regulatory authorities and policy makers.

6. Looking forward

RIA's vision remains to become a first port of call on cyberpolicy in Africa by engaging in pertinent and evolving global cyberpolicy challenges from a continental, uniquely African perspective.

The intersections of RIA's historically distinct research areas are increasingly apparent. A large portion of RIA's energies and resources have gone into developing and integrating our research into a post-telecom, digital think-tank. As much as we acknowledged the transformative potential of the Internet and related digital technologies for development, we have warned that it could compound inequality as has been illustrated by RIA's supply and demand-side assessment of users' perception of digital rights in the Survey.

While the technologies related to artificial intelligence, blockchain and the Internet of Things, for instance, can bolster economic inclusion and sustainable development but can just as easily reinforce existing patterns of exploitation. As a result, in its evolving research agenda RIA's has developed a research agenda that provides an evidence-base for digital policy/governance with a focus on digital rights. Within the African digital policy project five overlapping research areas are: Cybersecurity; data protection and justice; access, affordability, e-skills policy and regulation; e-service governance — taxation, microwork, e-trade; and innovation — with a focus on blockchain and Artificial Intelligence governance.

On the other hand RIA will continue to leverage the insights from the supply and demand side research to provide an African perspective on global cyberpolicy through the ongoing complementary After Access Survey (the Beyond Access) Global South that is now funded by IDRC and to a lesser degree SIDA.

The findings of the last round of surveys demonstrate that we do not have the necessary data in developing countries, and therefore in our global statistics, to determine where we are now or to know what progress is being made towards overcoming the 'digital divide' or achieve the ICT targets underpinning many of the UN General Assembly's Sustainable Development Goals. The 2017 #AfterAccess Survey goes some way to understanding the scale and nature of the digital divide in developing countries — in at least 10 of the 54 African countries. But, in those countries we know much more than that. The Survey goes much further than counting connectivity. Though 40 000 households and the same number of individual interviews were conducted in 20 countries across Africa, Asia and Latin America from surveys undertaken with LIRNEasia, our Asian partner, and DIRSI, our Latin American partner, we are able to tell the inside story of the Internet as it is being accessed and used in the Global South.

RIA will complete the mining and analysis of the rich data set but will seek together with DIRSI and LIRNEasia to find funds to repeat and expand the after access survey in 2020 (with the planning, questionnaire development, statistical review in 2019). It is only through nationally-representative surveys that we are able to collect data on unique subscribers, as opposed to that of active SIM cards collected by other agencies and organisations, and can now identify users as men, women or other, and can say how much they spend on communications or how their education levels affect what they are able to do online. The Survey collects all of the basic indicators required by the Partnership on Measuring the Information Society as well as those that have been identified as necessary to measure the SDGs. But it also goes further in identifying the factors underlying the digital divide as well as its depth. In addition, it looks at evolving and pertinent subjects in the technology industry, ranging from mobile money to microwork and cybersecurity.

Alternative Access Strategies

Many of these countries tend to adopt generic, so-called 'best practice' reforms; yet the #AfterAccess data reveals varied outcomes in developing countries. Broadband infrastructure indeed remains a challenge for many of the countries surveyed. Many of the countries still have less than the 20 percent

penetration level required to reach the critical mass that unlocks the networks effects associated with economic growth. But in some of these countries, even where there is over 90 percent mobile coverage and 50 percent of devices are Internet-enabled, the penetration rate is 20 percent lower than said critical mass levels. So, while supply-side challenges in terms of addressing the digital divide exist, connectivity alone does not reduce inequality. In fact, as technology evolves from voice to data services and Over-the-Top platforms, Internet of Things and Artificial Intelligence, the central policy challenge is that as ICT access and use increases so digital inequality is amplified.

The #AfterAccess findings for Africa show that affordability remains a key challenge in the Global South. The price of devices and data services is a significant barrier to Internet adoption and use – the intensity of which is a critical factor of digital equality. Although cost drivers in developing countries are high as a result of currency volatility on equipment imports, and the need to develop parallel infrastructure like roads and electricity, many causes of high costs can be reduced by governments and regulators. The very high regressive taxes on devices and equipment in some countries could bring down prices significantly. The effective regulation of wholesale access and market dominance could also reduce the cost of broadband as a critical input into other sectors of the economy.

RIA will be seeking funding to continue the interrelated supply-side data projects - namely Pricing Transparency Portal and the Internet measurement project. Together with the demand side data this is the only way a comprehensive picture of digital inequality can be determined and the price points of policy intervention identified.

What we do know with the high-level supply-side data available, and the in-depth demand side data we have from the surveys is that at the speed with which we are connecting people to the Internet today, we can never meet the 2020 target of global connectivity. The lag will continue to be from the Global South — Africa in particular. Even if cost-based prices in Africa were effectively regulated, the vast majority of Africans would still not afford the use of the Internet in any sustained and meaningful way at current prices based on existing business models, licensing frameworks and spectrum valuing and use.

We will need to move beyond commercial supply-side valuation of communications that currently underlies policy, sector and competition regulation, by exploring the extension of spectrum commons as well as unlicensed and social use spectrum. In developed and developing countries, most spectrum is largely unused outside the main metropolitan areas. The deployment of lower-cost dynamic spectrum and secondary spectrum use needs to be considered to provide low-cost, high-quality bandwidth. Enabling secondary spectrum use would enable new dynamic spectrum sharing, which operates at a fraction of the cost of GSM networks, and could be deployed with new business models in rural areas where the spectrum is largely unused. In the sharing-economy of the Internet era, we are already seeing voluntary infrastructure sharing by operators. These types of approaches need to be embraced by governments from a critical resources management perspective. With the long-term evolution of 5G underway, African governments need to ensure that the potential of 5G technology, which operates within a spectrum-sharing environment with data offloading to proprietary and open public Wi-Fi, is harnessed for public purposes and not just niche commercial applications.

Accepting that large numbers of Africans will not be able to afford to be optimally online, even if GSM broadband prices were cost-based, would force the deploying of spectrum to create and extend the commons (unlicensed spectrum) as a key enabler. Extending commercially available public Wi-Fi from elite urban areas, possibly through deploying poorly-utilised universal service funds or other public resources to all public spaces, offers a viable way of increasing the intensity of use in urban areas and enhancing network effects that would contribute to more inclusive digital development.

Capacity building: Intellectual and institutional

Arising from the findings of this research cycle, the next research agenda will need to address these problems. To get Africa meaningfully connected to an increasingly complex and globalised economy, it

will require doing things differently than in the present and past. The round of research will need to explore alternative policy and regulatory interventions that do not assume mature, competitive, effectively-regulated markets operating within guaranteed human rights frameworks; though of course we must continue to aspire to construct these. Recognising the constrained institutional endowments and resources that generally exist in African countries, we need to identify multiple strategies across the ICT ecosystem that will enable Africa to reach the critical mass and intensity of use needed for the network effects associated with broadband expansion.

As African countries transition from traditional telecom regulation to regulating for a data environment there is widespread failure by regulators to adapt to these complex disruptive systems and this is being exploited by Governments who are overreaching their mandates to create trusted and secure on-line environments by surveilling and censoring in the name of national security, crime control and now fake news.

Several governments are clawing back delegated powers of 'autonomous' regulators in the traditional areas of telecom regulation such as spectrum (often for purposes of maximising revenues for the national fiscus, through licensing and sometimes auctions). In some countries, such as Uganda, the disruptive entry of OTTs and lobbying by operators against them with calls for revenue sharing has been exploited by Governments to bolster their reserves through social network taxes that have undermined efforts by regulators in some countries to move towards policy objectives of affordable access.

In other countries such as Tanzania the government's use of secondary telecom taxes to fill the gaping holes in the national budget have been compounded by punitive blogging taxes requiring registrations that enable the surveillance and shutdown or non-registration of activists. I am sure we all have similar tales to tell.

This would seem to be the perfect time to offer evidence and analysis on alternative strategies to achieve universal policy goals of affordable access or to support the "Digital Visions" and "e-strategies" that are proliferating, very often in the very countries pursuing these retrogressive taxes or censorship and surveillance projects.

6.1 Capacity building

With the institutional constraints preventing this from happening, capacity building is required that will enable greater regulatory agility and insight to manage tensions between the different policy objectives of competitive efficiency, innovation and consumer welfare, as well as the safeguarding of the public and social value of the Internet.

6.1.1 Doctoral programme

To do this, whole new areas of multidisciplinary research capacity will need to be developed, opened up and applied in a developing country context. This will require collaborating with intellectuals and academics from the Global North to grow organic African policy intellectuals able to build new evidence bases for digital policy in Africa and to provide leadership on the global governance stage.

The aim is to interest university administrators in a sector without roots within the academic world. For this reason, the Nelson Mandela School of Public Governance, together with RIA, proposes the development of a multi-pronged strategy to contribute to removing research, policy and regulatory capacity bottlenecks within the digital ecosystem.

The strategy includes the development of a multi-level Digital Economy and Society in Africa programme at UCT that will leverage capacity from different departments on campus and collaborate with other national and international universities, as well as think tanks, to provide trans-disciplinary political, regulatory and research capacity building. The intention is to leverage the foundational contribution of the International Development Research Centre to the development of a doctoral programme that has been convened by Prof. Alison Gillwald at the Nelson Mandela School of Public

Governance, which has come to an end. The intention of the programme is to nurture policy intellectuals able to engage critically with national, continental and international public-policy processes emerging from the evolution of the Digital Economy and Society in Africa.

6.1.2 Executive development certificates/master classes

New forms of capacity are required in national and regional institutions to develop appropriate policies, regulation and governance frameworks. But, without some high-level research to develop new knowledge relevant to Africa that is able to deal with the complex linkages between national development, global markets, and governance systems, the complex-adaptive systems required to harness the benefits of developments in digitalisation for national development and global integration cannot be raised.

Because Africa has yet to deal with the infrastructural and human resource bottlenecks associated with the second and third generations of regulation while confronting these next-generation challenges, it does not have the luxury of dealing with them sequentially. It will need to continue to address the policy, regulation and competition issues associated with infrastructural and supply-side constraints while dealing with the gargantuan human development challenges facing the continent without which widespread infrastructure, even with affordable devices and services, will not produce digital equity.

This programme seeks to address the critical skills shortage in national regulatory agencies, government departments and parliamentary committees responsible for ICT policy. An executive professional development programme will be convened annually to focus on the changing policy and regulatory challenges in a broadband environment.

The intention of this programme is to partner with international experts to respond to ongoing and emergent needs for governance, policy and regulatory training. This takes the form of a certificate course and includes, among other things, traditional regulatory training on spectrum pricing, licensing for community networks or administrative data collection management and a commission programme such as the African Internet Governance School (AfriSIG).

Follows... Appendices