

Inclusive development & digital transformation in Africa

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Content

Challenges of evidence-based policy formulation to safeguard public interest outcomes in an increasingly globalised and complex environment

- ▶ ICT ecosystem (global, regional, national) and digital inclusion and equality
- ▶ Harnessing the economic and social impacts of the Internet for development
- ▶ Changing nature of good public statistics for evidence-based policy
- ▶ Changing environment – voice to data, complexity
- ▶ Regulation, investment and innovation – supply side
- ▶ Evidence – data – supply, demand, big – as public good
- ▶ Cross cutting nature – high levels of state co-ordination
- ▶ Beyond access barriers – demand stimulation
- ▶ Skills development – knowledge economy, local content
- ▶ Wider issues of affordability and new forms of access

Public Statistics for Evidence-based Policy

OPEN DATA – OPEN GOVERNMENT

ADMINISTRATIVE DATA

(Supply Side/regulated)

- Data from operators, service providers, equipment suppliers
- ICASA/ITU (Indicator Expert Group)
 - *(Demand side)*
 - *Nationally representative User Survey*
 - *(ZADNA/IDRC)*
- ITU/UNCTAD Partnership on Measuring Information Society

BIG DATA

Digitisation, mass processing, storage, analytics from large public/private data sets (Privacy/surveillance)

- cost reductions
- time reductions- real time
 - planning
 - evaluating

NATIONAL STATISTICAL DATA

(StatsSA)

- Macro-economic/
- Census/labour force/ households survey
- ICT Satellite Account

RESEARCH ANALYSIS - NRF, UNIVERSITIES/THINK TANKS, NATIONAL RESEARCH COUNCILS, PRIVATE COMPANIES/FOUNDATIONS

Performance Indices – South Africa

All methodologically problematic and major data source problems

	2014	2015	2016
ICT Development Index	90/175	86/175	88/175
Network Readiness Index	70/148	75/143	
Affordability Development Index	20/100	19/100	

Affordability indicator: GNPPC /price basket

STATISTICS SOUTH AFRICA

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P0310 (2015)

Table 7.2.13 – Percentage distribution of annual household distribution consumption expenditure by main expenditure group and province

	Western Cape	Eastern Cape	Northern Cape	Free state	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	Total
Number of households in sample	2 689	2 972	1 360	2 173	3 686	2 010	3 244	2 364	2 882	23 380
Main expenditure group	Percentages (%)									
Food and non-alcoholic beverages	11,7	14,5	15,1	14,1	16,1	15,7	10,5	16,1	17,0	12,9
Alcoholic beverages, tobacco and narcotics	1,1	0,6	1,1	1,6	0,8	1,1	0,7	0,9	0,8	0,9
Clothing and footwear	3,8	5,5	6,0	6,0	6,1	5,2	4,0	6,7	6,0	4,8
Housing, water, electricity, gas and other fuels	34,2	28,8	24,5	22,4	29,9	25,2	36,7	27,1	31,2	32,6
Furnishings, household equipment and routine maintenance of the house	5,3	5,2	5,3	6,5	4,7	6,2	5,1	5,2	5,3	5,2
Health	1,3	0,6	1,0	2,1	1,0	0,8	0,7	0,7	0,5	0,9
Transport	14,7	17,9	20,5	16,5	16,9	18,1	15,5	19,8	16,5	16,3
Communication	3,4	3,1	3,6	3,4	3,6	3,7	3,3	3,7	3,1	3,4
Recreation and culture	4,5	3,2	4,3	3,8	3,8	3,7	3,9	2,8	2,8	3,8
Education	2,5	2,6	1,2	2,0	2,3	1,9	2,6	2,6	2,4	2,5
Restaurants and hotels	2,2	1,3	1,6	3,5	1,7	2,3	2,2	2,3	1,5	2,1
Miscellaneous goods and services	15,1	16,6	15,9	17,9	13,2	16,1	14,6	12,0	12,8	14,7
Other unclassified Expenses	0,0	0,0	0,0	0,1	0,0	0,1	0,1	0,0	0,1	0,1
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Due to rounding, figures do not necessarily add up to totals

Affordability: Price basket as percentage of household expenditure by income quintile

3.4 EXPENDITURE AND INCOME QUINTILES

Figure 3.5: Percentage distribution of households by expenditure per capita quintiles and population group of the household head

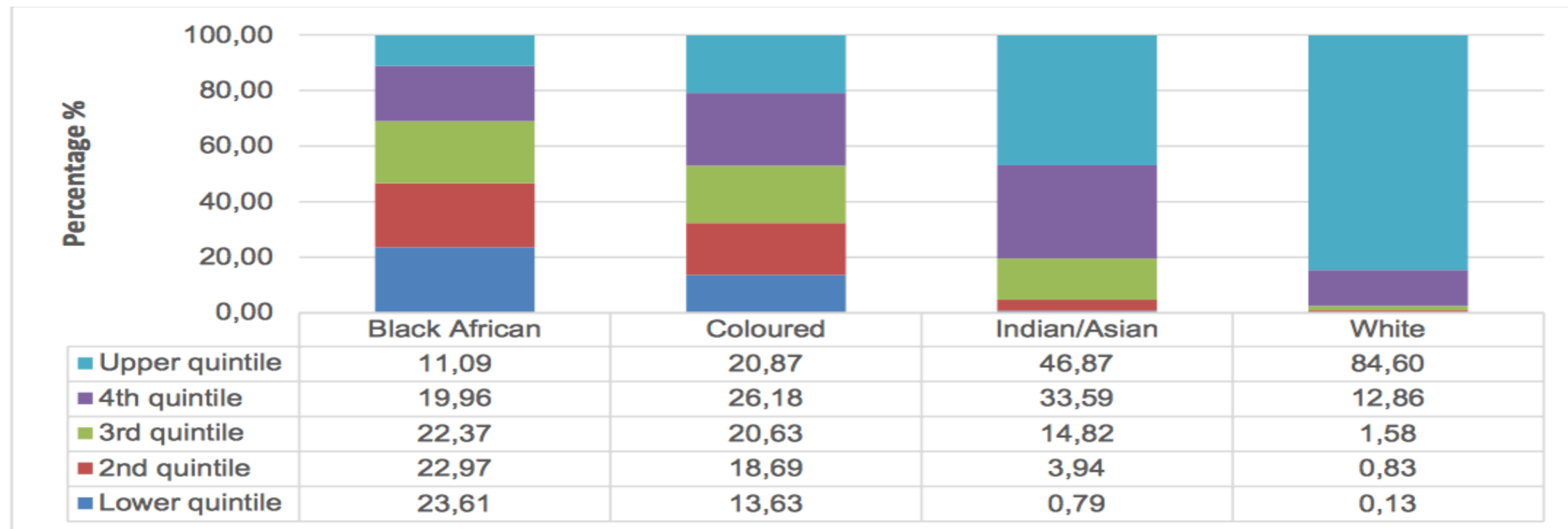


Figure 3.5 looks at the distribution of households according to expenditure per capita quintiles within each population group. The graph examines differences in the spending patterns of the four population groups. The expenditure per capita quintiles have the following values:

- Upper quintile: R52 078 and above
- 4th quintile: R23 156 – R52 077
- 3rd quintile: R12 781 – R23 155
- 2nd quintile: R7 030 – R12 780
- Lower quintile: Up to R7 029

National ICT Satellite Account

Figure 2: ICT sector contribution to gross value added compared with other industries, 2012

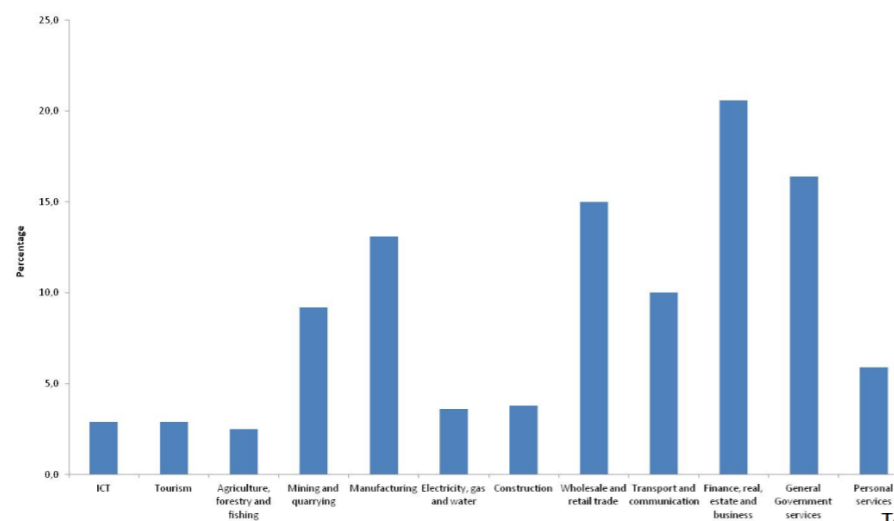


Table 1: Information and Communication Technology share of gross domestic product by Information and Communication related activity, 2012

Activities	ICT industry output (Rand million)	ICT gross value added (Rand million)	Share of ICT gross value added (%)	Share of total gross value added (%)	ICT GDP (Rand million)	Share of ICT GDP (%)	Share of GDP (%)
ICT-specific activities							
Manufacturing	23 249	6 219	7,2	0,2	6 618	7,0	0,2
Telecommunication services	160 784	60 898	70,9	2,1	64 806	68,4	2,0
Computer services and activities	26 648	6 898	8,0	0,2	7 340	7,7	0,2
Content and media	17 099	5 513	6,4	0,2	5 867	6,2	0,2
ICT-related activities							
Trade	453	409	0,5	0,0	3 227	3,4	0,1
Related industries	13 086	5 941	6,9	0,2	6 855	7,2	0,2
Total	241 318	85 878	100,0	2,9	94 715	100,0	2,9

Table 3: Domestic output of Information and Communication Technology products by producing industry, 2012

Products	Manu- facturing	Telecom- munication services	Computer services and activities	Content and media	ICT related industries	Total
ICT products						
Office, accounting and computing machinery	7 347	0	0	0	0	7 347
Radio, television and communication equipment	12 605	10 541	0	43	0	23 189
Miscellaneous ICT components and goods	2 858	0	0	0	0	2 858
Leasing or rental services without operator	1	159	1 113	0	8 018	9 291
Other professional, technical and business services	0	1 445	23 831	0	2 127	27 403
Telecommunication, broadcasting and information supply services	0	148 398	0	0	1 501	149 900
Content and media	266	144	2	17 052	1 893	19 357
Non-specific products	171	97	1 702	4	N/A	1 973
Total	23 249	160 784	26 648	17 099	13 539	241 318

Data in this table are considered experimental in nature. Individual figures may not add up to stated totals due to rounding.

Table 7: Capital formation in Information and Communication Technology products, 2012

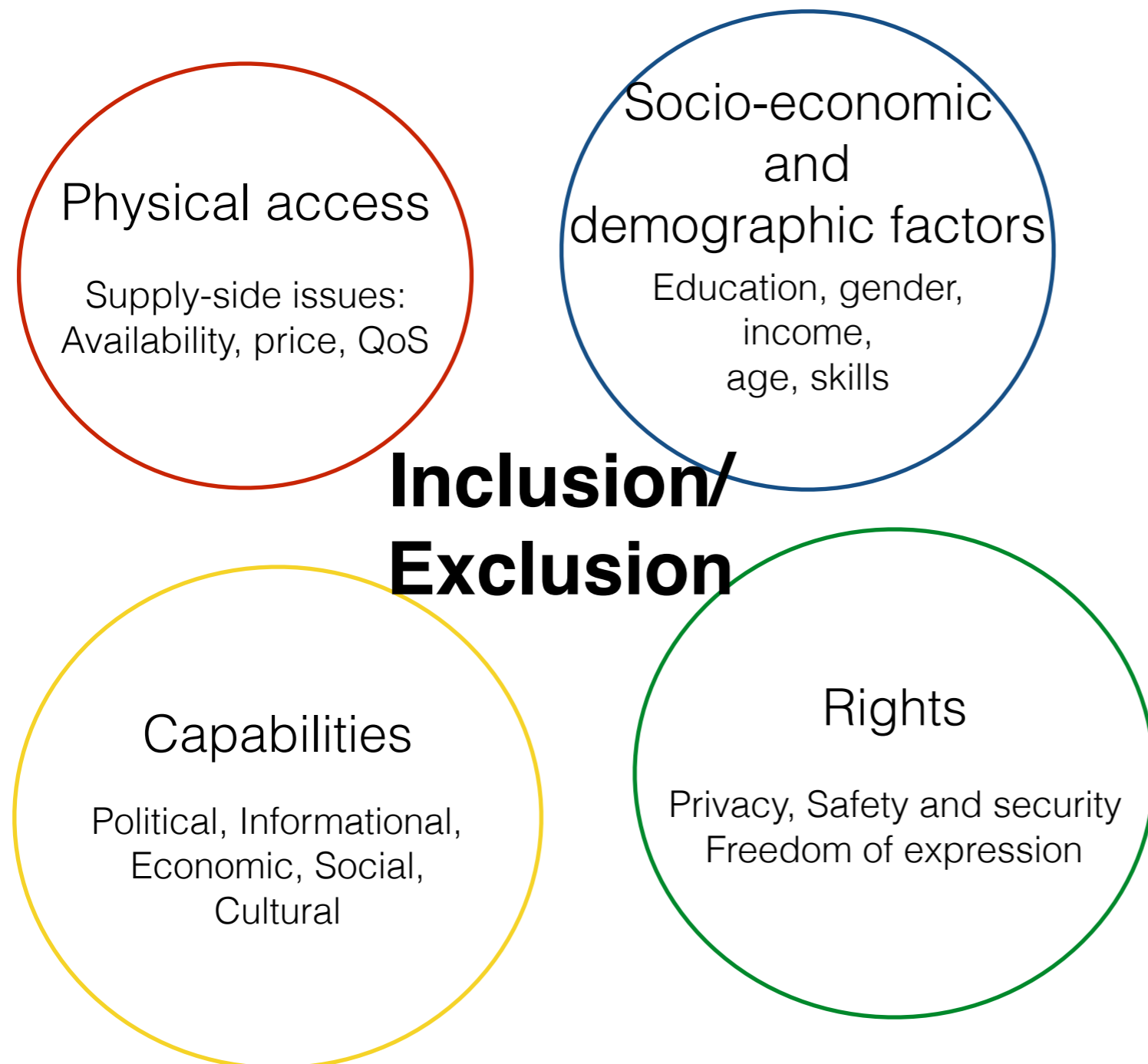
Products	(Rand million)
Office, accounting and computing machinery	24 679
Radio, television and communication equipment	3 038
Miscellaneous ICT components and goods	528
Leasing or rental services without operator	0
Other professional, technical and business services	0
Telecommunications, broadcasting and information supply services	0
Content and media	373
Total ICT capital formation	28 618
Total capital formation	614 505
ICT capital formation as a proportion of total capital formation (%)	4,7

Data in this table are considered experimental in nature. Individual figures may not add up to stated totals due to rounding.

In 2012, office, accounting and computing machinery was the largest contributor to ICT capital formation (R24 679 million). The total estimated ICT capital formation in the economy was R28 618 million (4,7% of total capital formation²⁴ in the economy).

ICT access and use survey

Understanding digital inclusion and exclusion



- Numerical data/Nationally representative
- Representative figures (who, what, where, and when)
- Primary data collection

Combining quantitative and qualitative research

- Qualitative research informs Quantitative methodology
- Qualitative research to understand Quantitative results

IDRC RIA ZADNA: Beyond access

▶ **Problem:**

- digital technologies boost growth, opportunities, and improve service delivery. BUT: aggregate impact has fallen short and is unevenly distributed.

▶ **Research objectives:**

- to fill research gaps by moving beyond high level descriptive indicators primarily focused on access to understand the social and economic factors determining digital inequality, even once people are connected;
- to inform policy by taking the systematic and rigorous evidence into policy processes

▶ **Research methodology:**

- Nationally representative survey in ZA – ICTi4SouthAfrica
- Comparative research – ICTi4Africa

...To complex ICT ecosystem

Internet as a global distribution network, stimulated by convergence between media, telecommunications and IT, facilitated the provision of content (audio-visual) over converged IP networks, across multiple devices, with layers of governance at the international, regional and national levels.



Complex adaptive systems - research

- ▶ ICT ecosystem characterised by exponential technological development and increasing dependency on connectivity for positive social and economic national outcomes.
- ▶ No longer linear or hierarchical value chains but complex adaptive systems that innovate to circumvent bottlenecks often through disruptive competition
- ▶ Unintended outcomes of instrumental regulation for one objective (competition) produce negative outcomes in other (eg. innovation or investment)
- ▶ Need to move from regulation of static linear value chain to adaptive, flexible regulation that does not stifle product, pricing and user innovation
- ▶ Competition regulation (static efficiency) needs to be complemented by understanding of dynamic, complementary relationship between different elements in ICT ecosystem

Changed market conditions

- ▶ 'Best practice' and old measurement instruments no longer appropriate especially for predominantly pre-paid mobile market in Africa
- ▶ saturated voice markets shifting to data
- ▶ introduction of low-end smart phone driving data demand
- ▶ declining revenue from traditional services, data opportunities and revenues growing
- ▶ multiple new business models emerging from data competition to retain and attract new customers
- ▶ zero-rated services, social media bundles, blended bundles, build-your-own-bundle.
- ▶ multiple user strategies to access and use Internet – substituted voice and text data services, public wifi for updates, U-tube.
- ▶ more users, more devices, more services, more demand vs amplified inequality – access, intensity, and capabilities.
- ▶ Require new universal access & use strategies (intensity)

Underperformance

- ▶ Dynamic systems such as the advanced ICT system may be “stuck” in an underperformance state (“attractor”) (Bauer 2013)
- ▶ Insufficient investment and innovation – Inefficiently high or low prices. Multiple causes:
 - Regulatory—regulation outside the workable performance zone (too strict, too lax)
 - Political—veto players capable of blocking change/innovation
 - Institutional—capacity/capabilities constraints – wider institutional and political endowments.
 - Can be overcome but only after considerable costs

Reform 0.3 - From static to dynamic regulation

Creating conditions that facilitate high capital investment required for deployment of next generation networks to support innovation

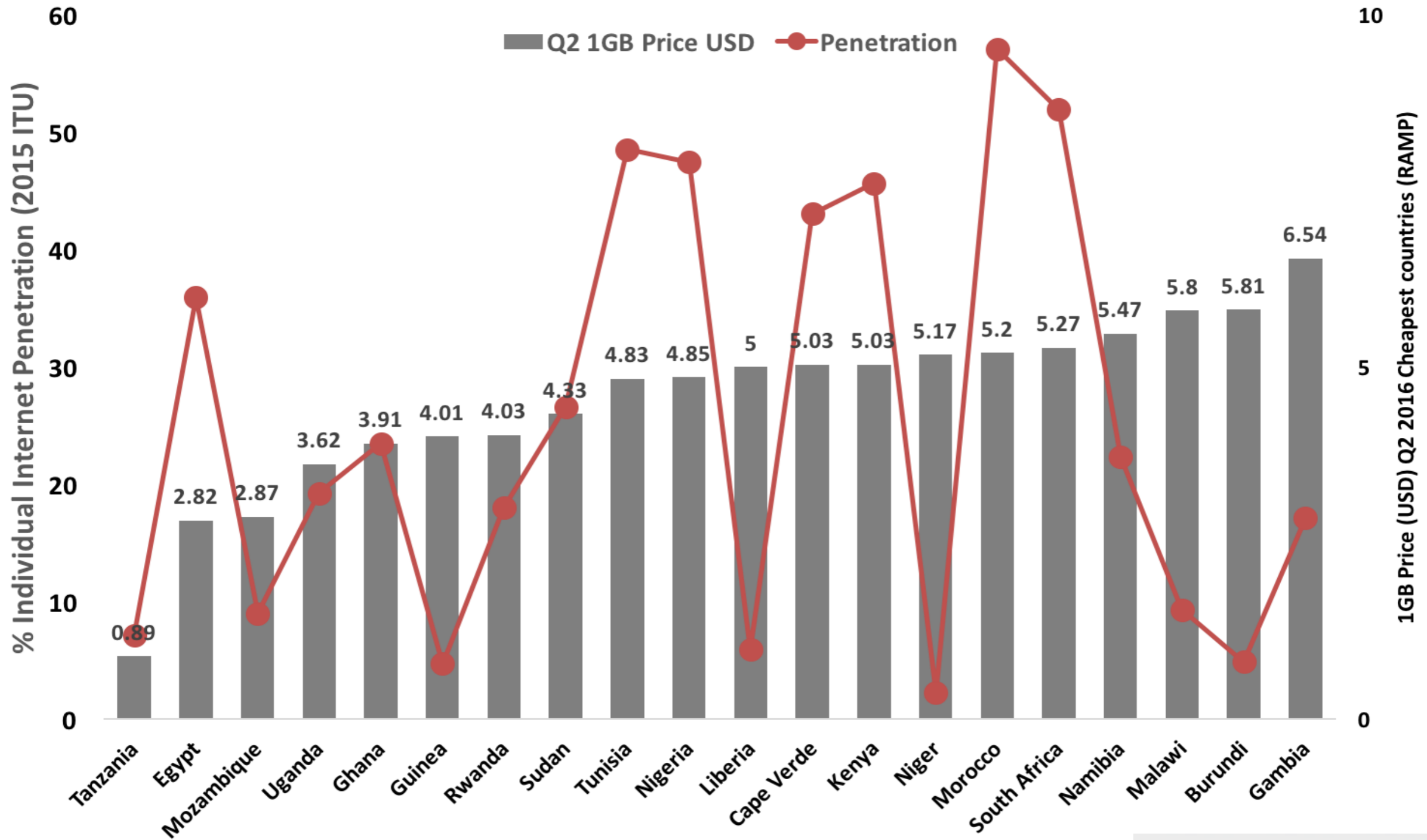
- ▶ Static regulation transition from monopoly to open market (assumes core network infrastructure in place).
- ▶ Structural and conduct regulation at wholesale level (interconnection, unbundling, price regulation).
- ▶ Digitisation and convergence allows for multiple entrants, migration of services and content across platforms.
- ▶ High levels of substitution - fixed, wireless, instant messaging, social networking.
- ▶ New complementarities - content & apps

Pricing

- ▶ Voice usage is declining.
- ▶ Data represents an increasing percentage of overall revenues.
- ▶ Mobile data is also the basis for Over-the-Top (OTT) services: subscribers usually have a data package to make use of OTT services such as Skype or WhatsApp.

RAMP Index: 1G UPDATE (2016)

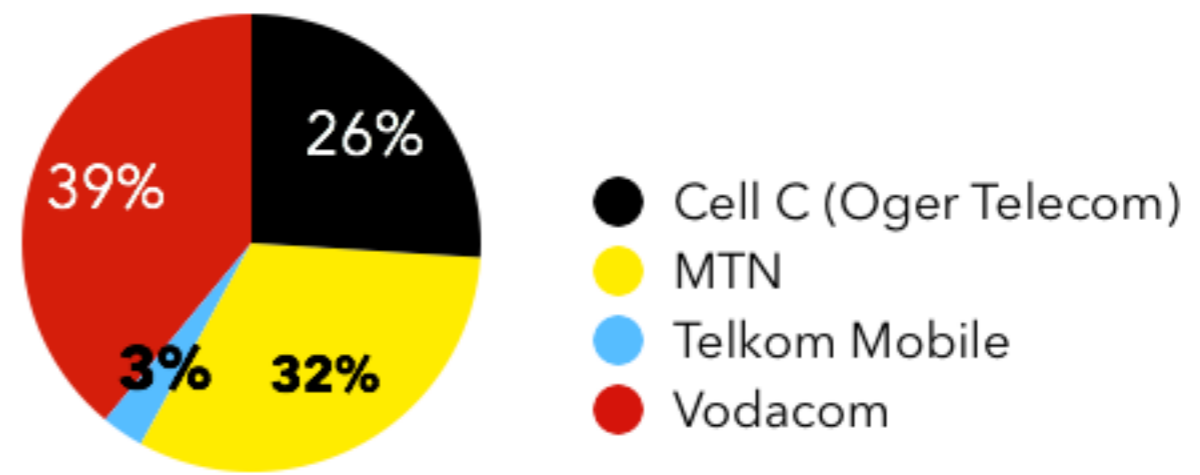
www.researchICTafrica.net/ramp



Demand Side: Qualitative understanding to strategies of data management

- Pre-household survey focus groups conducted in **Nigeria, Kenya, Rwanda, and South Africa.**
- Purpose:
 - Assess the way people make use of subsidised data
 - Assess urban-rural and male-female differences.
- Motivations:
 - Cheaper means of communicating and information seeking
 - Shorter-term data bundles are more affordable
 - Rural users connect to the only operator(s) with coverage in the area - often at higher costs in comparison with competitors - rural users do not have the same market choice.
- Identified barriers:
 - Affordability of data/services; as well as the quality of service
 - Negative content is an increasing concern for women
 - Non-internet users indicate a need for digital training in order to use the internet.

South Africa



- ▶ Voice and SMS revenues in decline while data revenue increases
- ▶ APRUs declining
- ▶ CellC embraces OTT - zero rated Facebook and WhatsApp

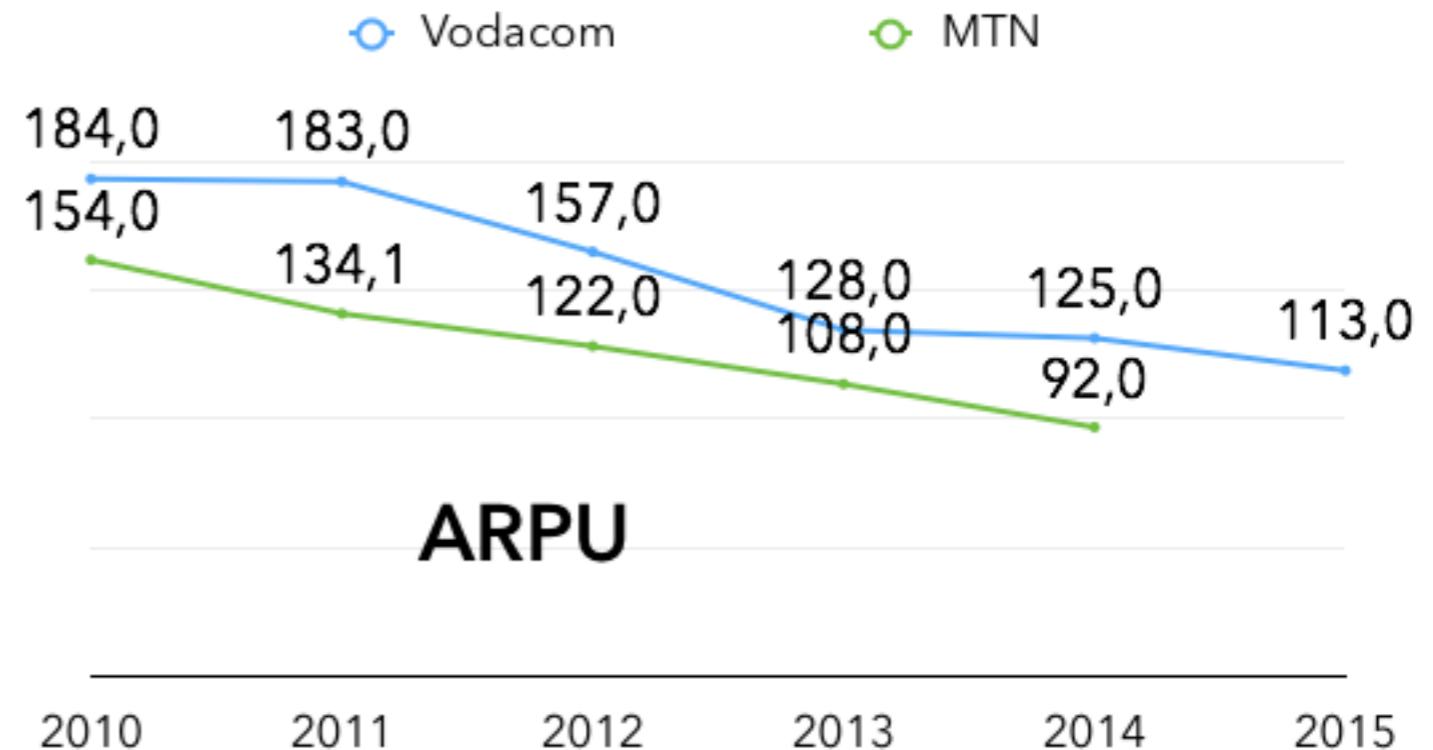


Table 5: Revenues in R(m)		2013	2014	2015	Change
Vodacom	Mobile voice	29 151	28 135	25 855	Down
	Mobile messaging	3 027	2 675	2 522	Down
	Mobile Data	8 882	10 974	13 538	Up
MTN	Mobile voice	22 125	19 677	18 739	Down
	Mobile messaging	2 365	2 069	1 922	Down
	Mobile Data	8 656	9 264	12 709	Up

Quality of Service

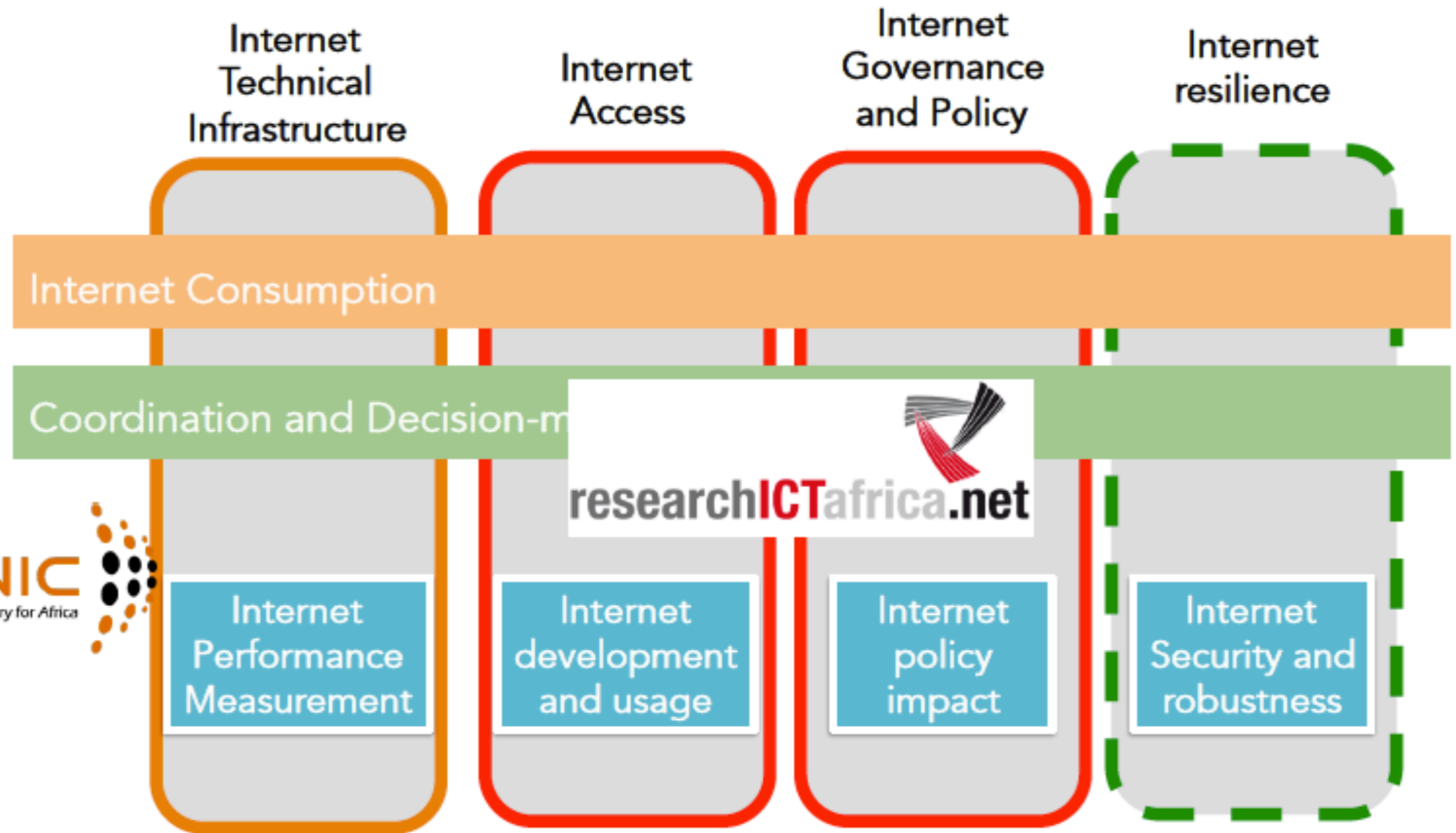
- ▶ Objective: develop standard methods to measure broadband performance in resource constrained environments
- ▶ Partnerships:
 - Global: M-Lab, Princeton University, Queen Mary, Cambridge (Africa Internet Measurement Observatory)
 - Regional: AFRINIC

Supply side solutions

Creating enabling environment for next generation networks and services with positive consumer welfare outcomes

- ▶ State create enabling environment for investment and innovation – PP Interplays, alternative policy/ regulatory strategies that leverage public and private resources, harness national multistakeholder skills base.
- ▶ Allocate high demand spectrum so operators can efficiently provide services
- ▶ Service neutral licences and services so operators and service providers can develop flexible complementary relationship
- ▶ Confirm consumer welfare and particularly pro-poor outcomes
- ▶ Ensure that rights and cybersecurity framework in place to created trusted environment

AFRINIC/RIA



AFRINIC
The Internet Numbers Registry for Africa

OPEN ACCESS – findings¹

- ▶ Open access should only be considered in dominant markets - **need for market review** to establish *abuse of dominance* across integrated value chain
- ▶ High bureaucratic skill and institutional capacities required for market restructuring – structural separation/open access network
- ▶ Rather use simple and competitive allocation of resources (spectrum auction with room for correction – spectrum trading)
- ▶ Beware opportunity costs of delays/risk of failure

OPEN ACCESS - findings 2

- ▶ A mandatory open access wireless network would threaten the incentive to invest by siphoning off high-demand spectrum.
- ▶ The risk of prioritising urban areas by mobile operators can be mitigated by enforcing prior rural coverage through spectrum assignment conditions.
- ▶ Commercial networks voluntarily adopt open access principles when traffic aggregation is prioritised at the correct price point.
- ▶ By acting as the anchor tenant in underserved areas Government can incentivise private investment with its long-term demand aggregation guarantees.

Technology solution for almost every problem but...

- ▶ Dependent on functional ICT ecosystem as backbone of modern economy – needs to be made inclusive
- ▶ Role of state to provide an enabling environment not only for optimal use of new technologies and services but local production and innovation (incentives and skills)
- ▶ Create conditions for investment and human development for economic growth and job creation
- ▶ Retain and stimulate high sunk cost (largely private) investments through forward looking policy, adaptive regulation and capacitated institutions that enable trusted and secure Internet for users necessary for applications and monetisation of innovations

Citizen-centred service delivery

- ▶ New services and devices, amplify digital inequality, unless focused on redress.
- ▶ Beyond access barriers to digital equality and optimisation of ICTs for individual, community well-being
- ▶ Pro-poor strategies need to shift from purely supply side strategies to demand stimulation
 - Ensuring affordability through effective regulation and public access innovation
 - Build e-skills base for effective social and economic inclusion
 - Trusted environment for e-transactions, e-gov (mobile apps)

Modernising government

- WWW + Desktop > Web 2.0 + mobility > Cloud + Streaming > Internet of things
- Cloud first policy: Cost savings, agility, service delivery improvement, security
- Commodification, hyperscale, scalability, resilience
- IAAS, PAAS, SAAS – public, private, hybrid
- Individuals, businesses, public sector beneficiaries of economies of scale much greater than their own.
- RANTIP – African MENA cloud research network

Conclusions

- ▶ Open government, open data, public statistics.
- ▶ Governance framework for open data, big data.
- ▶ Need continuous quantitative and qualitative demand side data to understand intersectionality of inequality - class, gender, race, location, disability (rural or urban).
- ▶ Co-ordinated, adaptive and complementary research agenda with independent, public domain research.