On Baseline Inputs and Outputs to Increase participation rates in Higher Education in Africa

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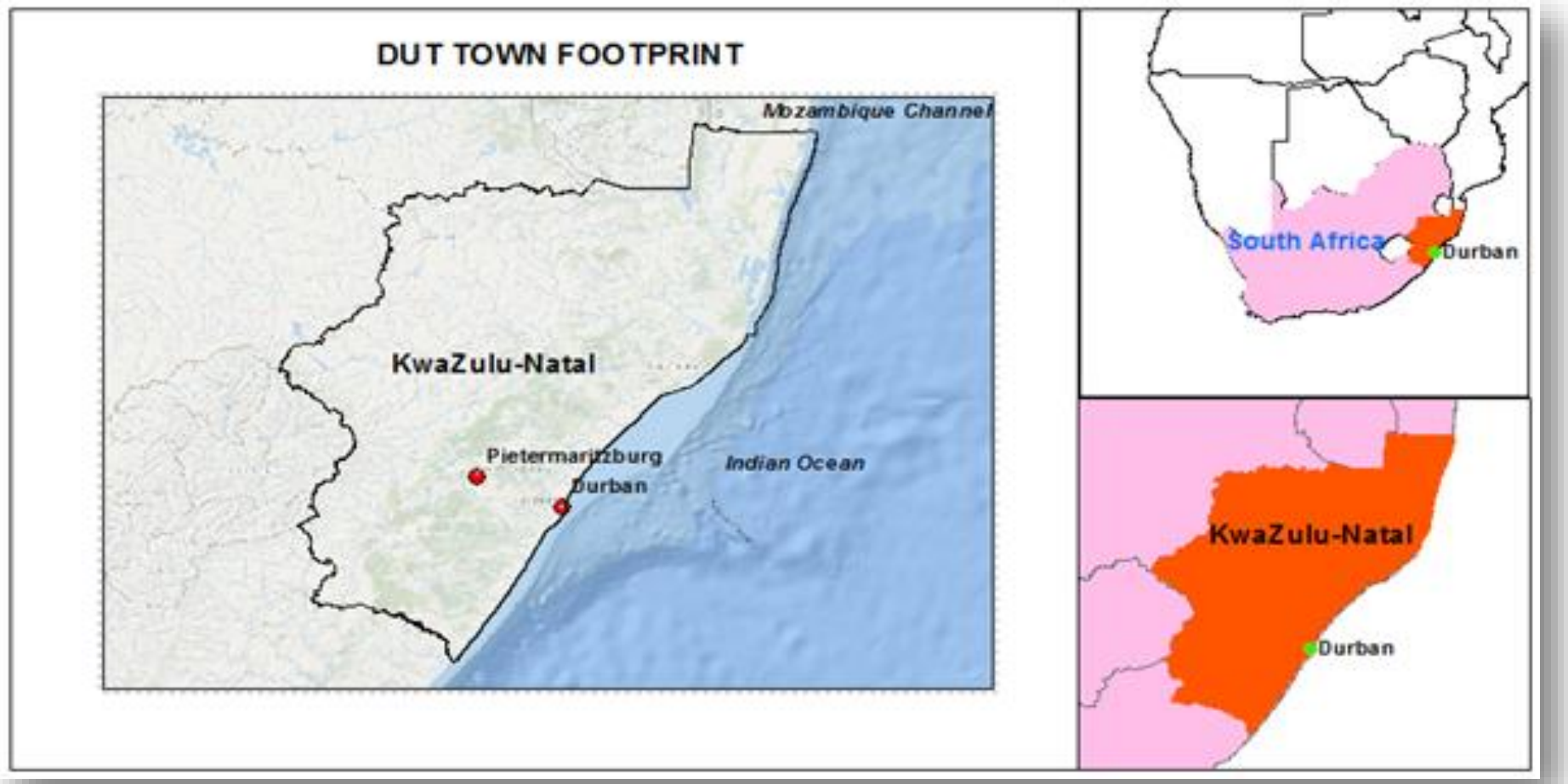
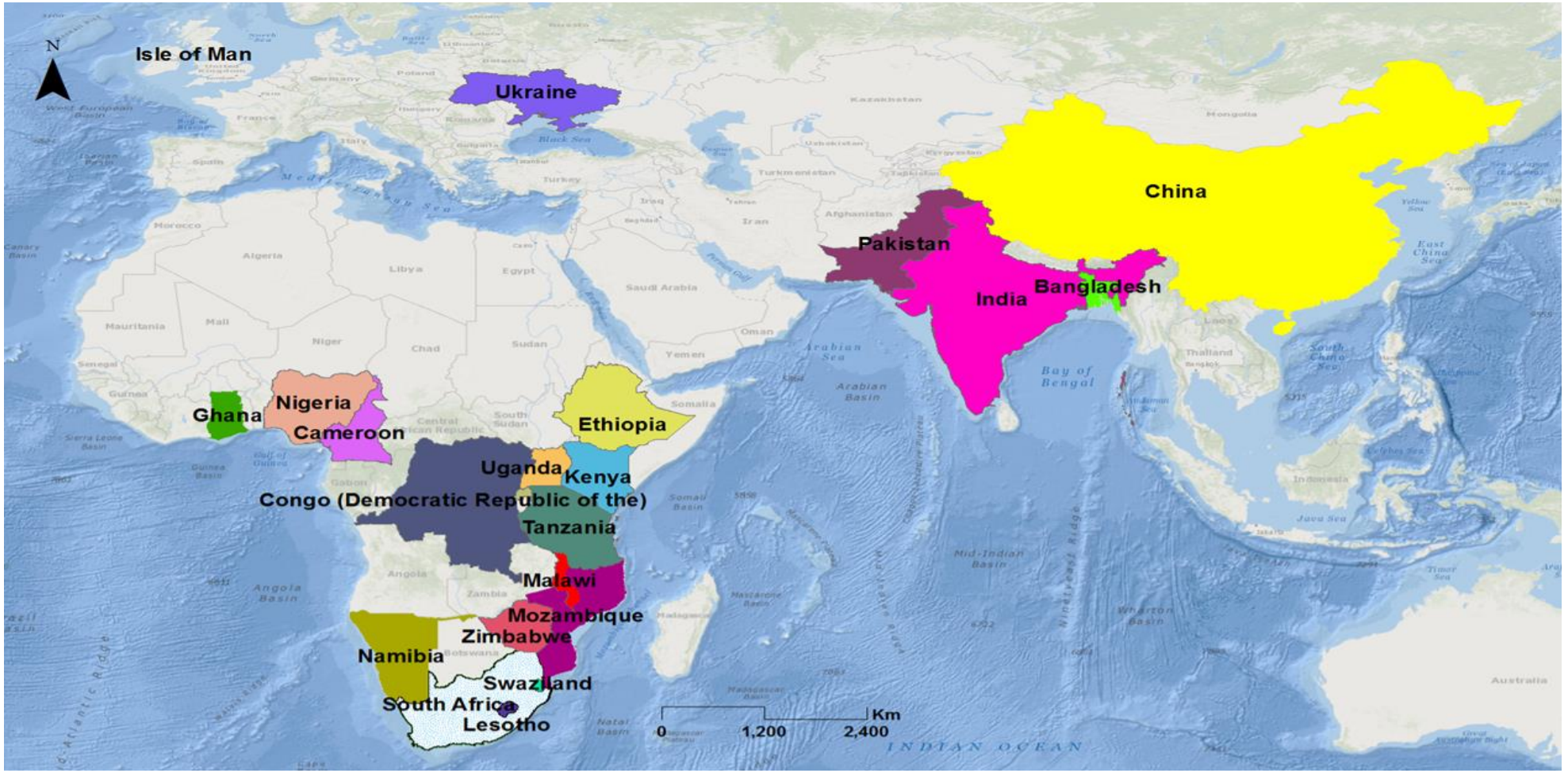
Durban University of Technology (DUT) Footprint





The figure shows that from 2003 up to 2014, DUT students have been taped from as far away as Isle of Man in the North Western hemisphere, across to China and down to the South African expanse where the majority come from.

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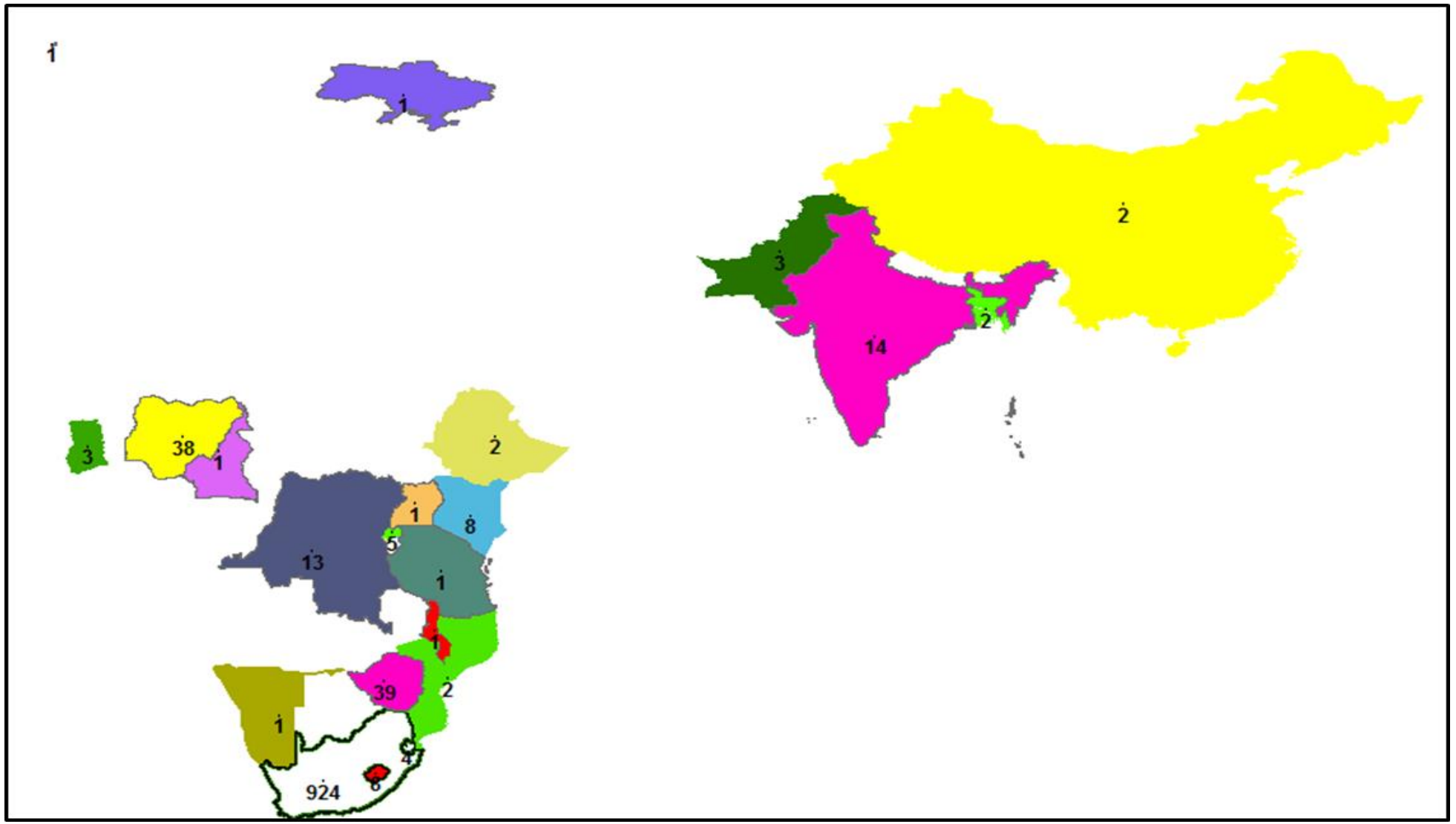
Enrolment by Country 2014 at DUT



Observations: Inward mobility

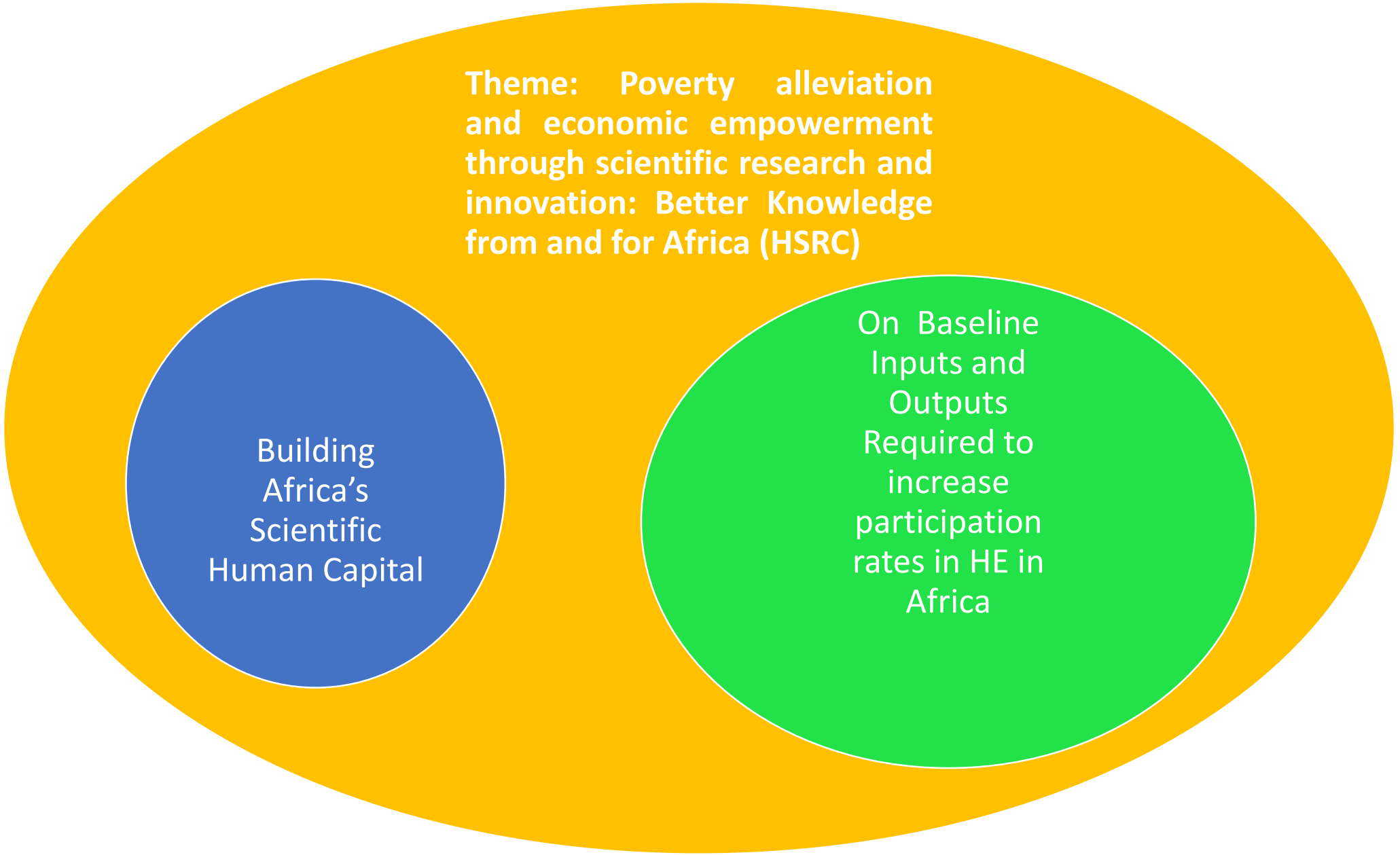
Even though in the South African context we have higher enrolments especially for females,
the global footprint for DUT shows that females are not as mobile as their male counterparts.

For example, Numbers at masters level for **Nigeria**, show that (9) females were recorded to have been enrolled at DUT as at August 2014 and almost double the number (17) was recorded for males.

The trend was recorded for Zimbabwe at masters level as well (7 females/10 males).

These figures have a bearing on mobility at postgraduate level; and
the enabling and disenabling environments to Postgraduate studies for the two gender groupings.

Structuring fellowships for doctoral studies or postgraduate studies – it is valuable to have options for In-Country studies. For example DAAD/NRF allows for In-Country Doctoral Fellowships while OWSD allows for studies within the continent but outside the home country.


Theme: Poverty alleviation and economic empowerment through scientific research and innovation: Better Knowledge from and for Africa (HSRC)
Building Africa's Scientific Human Capital
On Baseline Inputs and Outputs Required to increase participation rates in HE in Africa

Human Capital Theory:

- What is human capital? And why is human capital development and retention important in Africa?

Human capital in labour economics is defined as a set of skills/characteristics that increase a worker's productivity.

Input: Education –education helps to create improved citizens and helps upgrade the general standard of living within a society.

(What is the role of HEIs and are we training the graduate of the future or our graduates being trained for obsolete functions?)

Belief/Perception: Expanding Education promotes Economic Growth. (Not easy to prove in African context?)

SA National/Regional Level: GenderInSITE Southern Africa (What are we doing?)

ASSAf – hosts OWSD SA National Chapter which also coordinates GenderInSITE activities in Southern Africa. he Focuses of these activities is on the following:

1. Policy development
2. **Human capital development**
3. Promotion and awareness raising
4. SITE for all
5. Building strategic partnerships.

Human Capital Development in Relation to SITE

- Sharing information on the barriers to girls' enrolment into secondary school and recommendations on how these could be reduced/ eliminated.
- Implementing activities aimed at providing evidence based advice on the importance of inquiry based science education for the SADC region.
- Documenting the career pathways of young women and men in SITE in the region as a way of highlighting and providing solutions to barriers.

WOMEN in SITE: Regional Averages

Regional averages, (2009), female share of persons employed in R&D: (staff employed both full-time and part-time)

- 45.2% for Latin America and the Caribbean ·
- 34.0% for Europe
- **34.5% for Africa**
- 18.9% for Asia
- 39.2% for Oceania.

- Conversion rates of women into leadership and decision making positions:

➢ **17% of heads of universities in South Africa were female (2011)**

➢ **23%** in the US (2006).

OWSD SA National Chapter

- **Promoting the participation of women in S&T in South Africa**
- Promoting scientific and technological development of South Africa
- **Facilitating access to opportunities for women in S&T in South Africa**
- Popularising and promoting S&T for the general welfare of South Africa
- Creating linkages between science and society in and beyond South Africa

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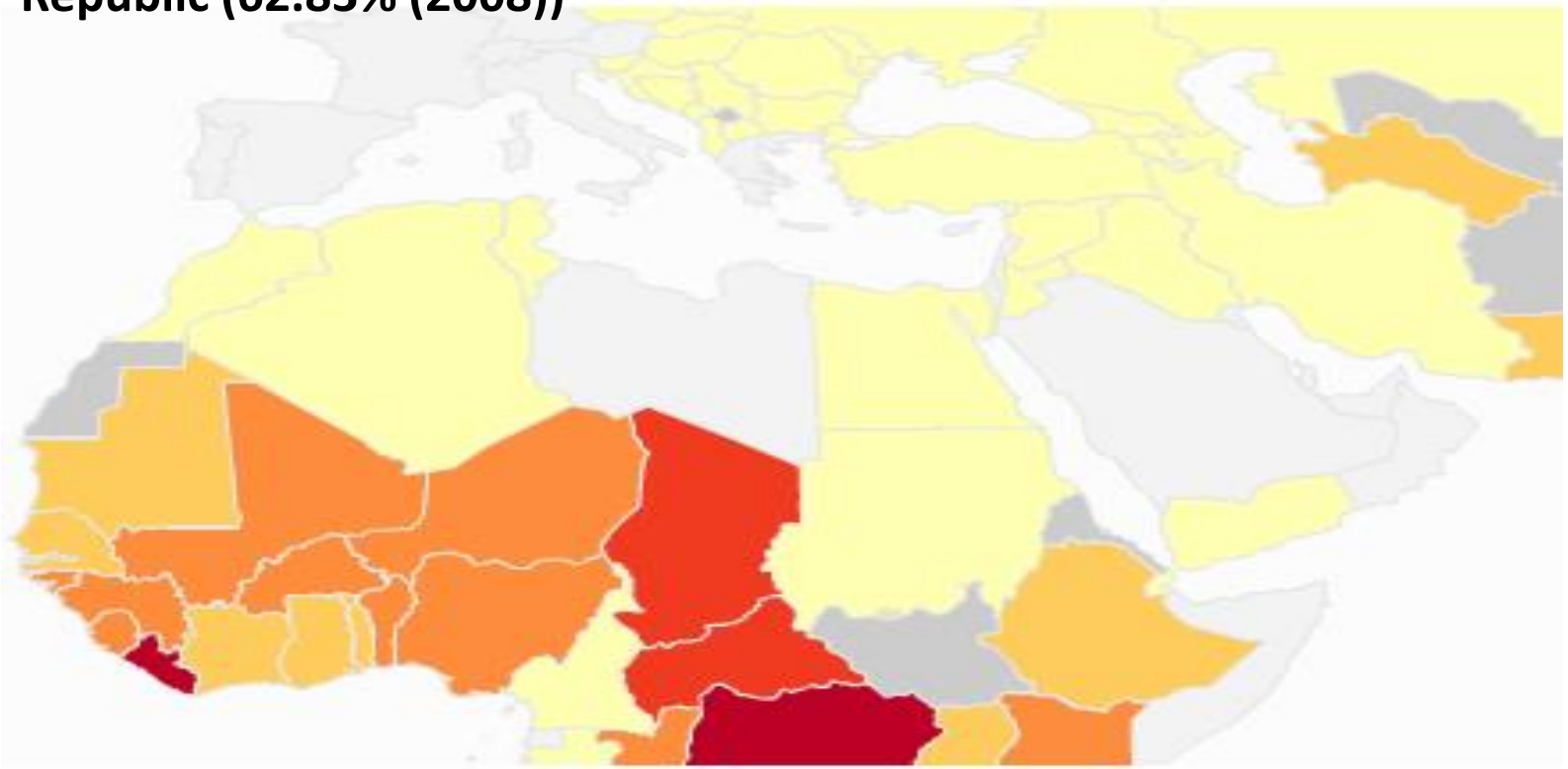
North Africa & Middle East: Chad (61.94%(2003)) & Central African Republic (62.83% (2008))



Comments:
Indicator: Poverty headcount ratio at $1.25 a day (PPP) (% of population)
Year: 2012

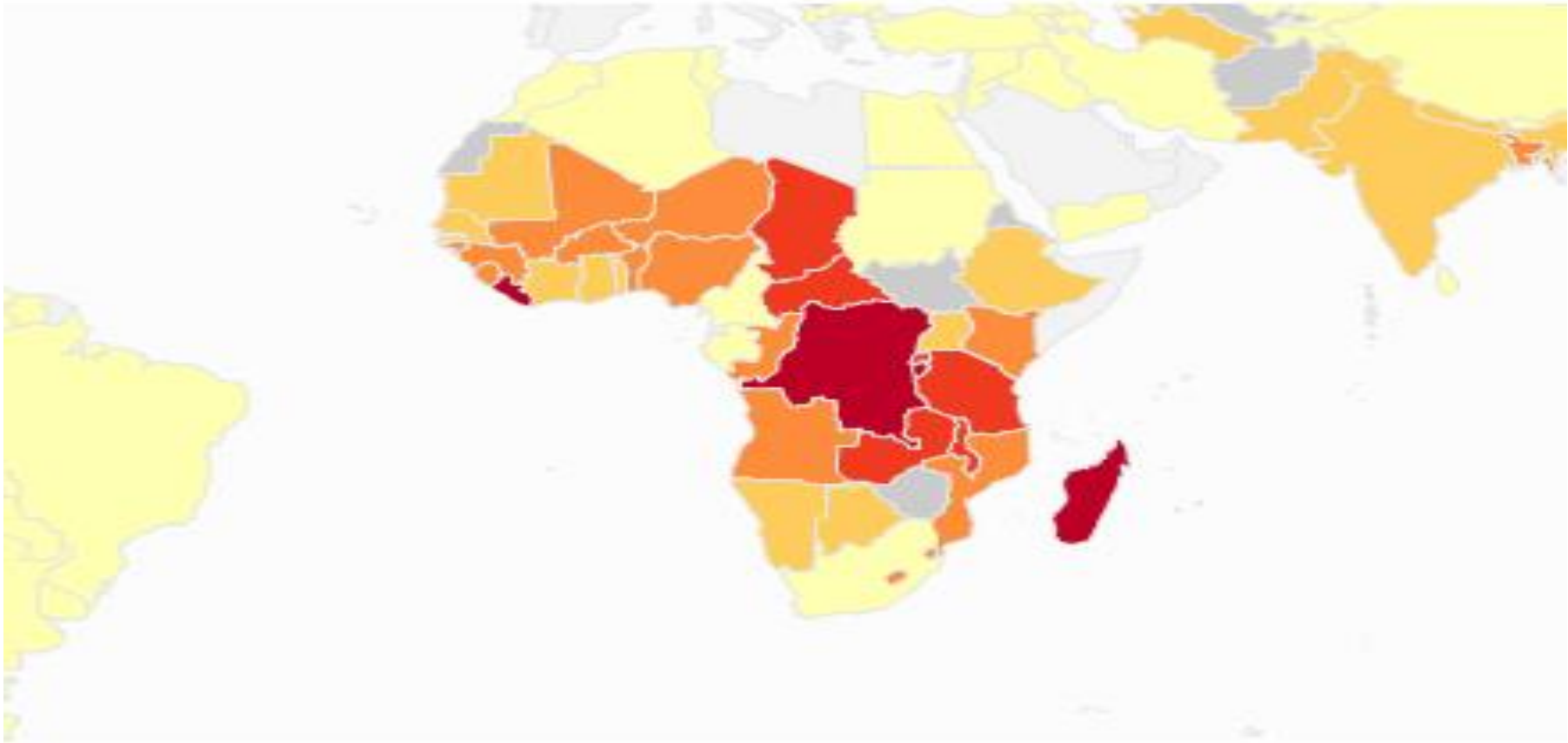
no data | 0 - 20.0 | 20.0 - 40.0 | 40.0 - 60.0 | 60.0 - 80.0 | 80.0 - 100

- Recent Statistics STATS SA press release shows that the Poverty Trends Report released reveals that ”people living below the food poverty line (FPL) has dropped to 20.2% of the population” (see http://www.statssa.gov.za/?p=2591).

***Unemployment, access to education, dropout rates, poor quality of education for the masses despite huge investments in the last decade are still a challenge**!

***Social inclusion/exclusion; gender based violence; HIV/AIDs; Race, Equity, Xenophobia, religious divides, geopolitical conflict** etc.

Zimbabwe (No data); Zambia (74.45% (2010)); Angola (43.37 % (2009); Congo (87.72%(2006)); South Africa 13.77%(2009)



What is the Baseline Status:

- Africa remains one of the poorest continents and yet has huge deposits of natural resources and untapped human resource and potential:
- Africa is also the fastest growing economy and a “Gold mine” for investors from other continents. What is the implication?
- What are investors looking for: Inputs & Outputs (Resources vs Skills training)
- How sustainable is the future if appropriate scientific human capital is not developed and retained?

Global Competiveness Index (GCI)/Country Profiles in Africa

- **Country Profiles are defined in terms of competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country.**
- Level of Productivity:

➢ sets the level of prosperity that can be reached by an economy.

➢ determines the rates of return obtained by investments in an economy, which are the **fundamental drivers of its growth rates**.

- A more competitive economy is one that is likely to grow faster over time (GCI Report, 2014-2015).

Drivers for Economic Growth (GCI Report: 2014-2015)

- ***Cities & ICT** – over ½ of the world's population lives in cities.

Pillars:

Key **for** Factor-Driven Economies: (Stage2: e.g. South Africa & Swaziland)

- **Institutions**
- **Infrastructur**e
- **Macroeconomic environment**
- **Health and Primary Education**

Efficiency-Driven Economies (Only Mauritius) (stage2 to 3)

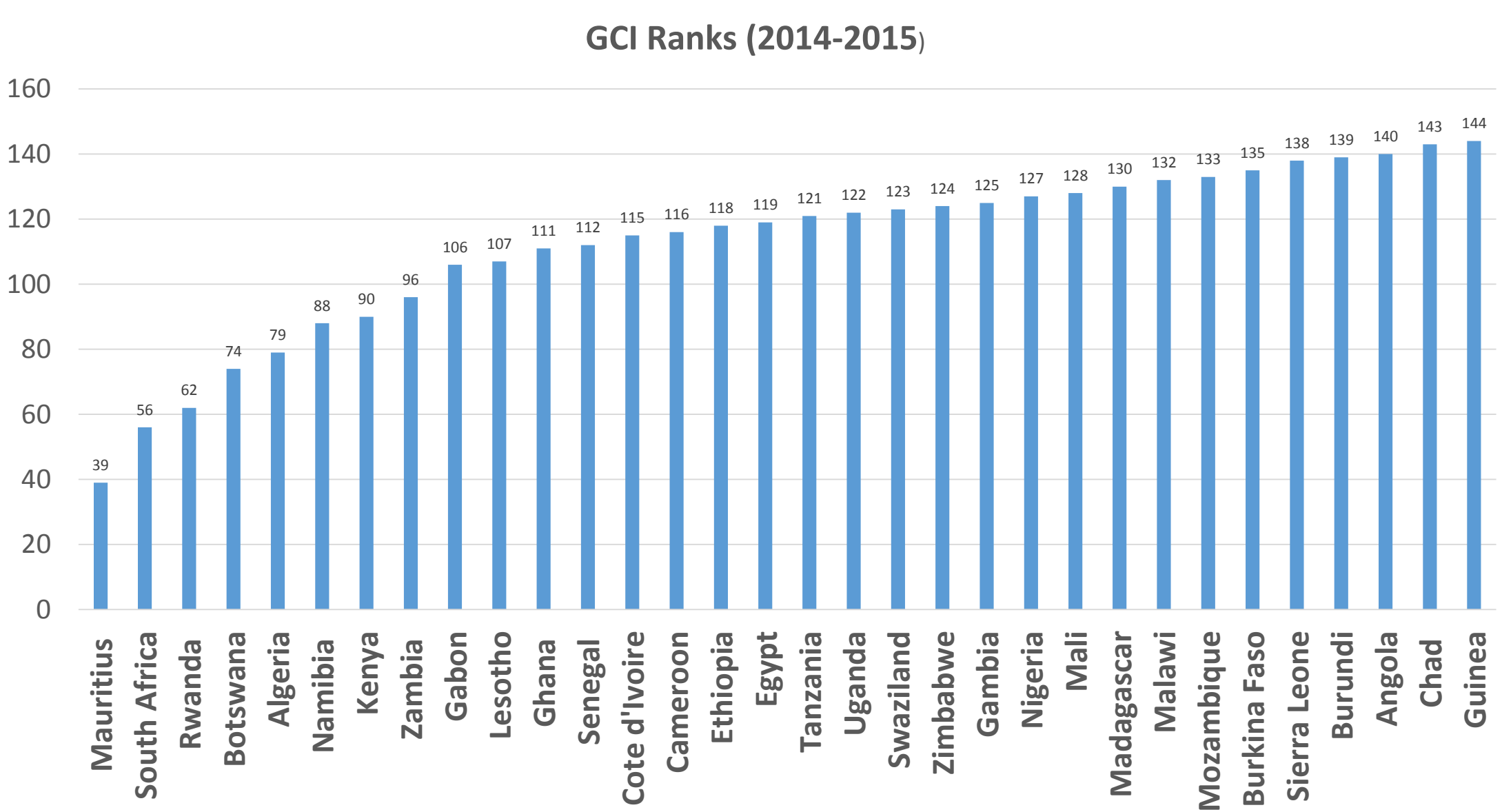
Higher Education and Training; Goods market efficiency; labour market efficiency; Financial market development, Technology readiness and market size.

Innovation driven economy (No African Country in this category) – stage 4?

- Business sophistication and Innovation

Rankings According to GCI (2014 -2015)

- Switzerland – 1st; Singapore – 2nd
- Mauritius – 39th
- South Africa – 56th
- Rwanda 62nd
- Botswana 74th
- Algeria 79th
- Namibia 88th
- Kenya 90th
- Zambia 96th; Guinea 144th; Gabon -106th; Lesotho 107; Ghana 111; Senegal 112; Zimbabwe 124th; Namibia 127th; Côte d'Ivoire 115th; Cameroon 116th; Ethiopia 118th; Egypt 119th; Tanzania 121; Uganda 122; Swaziland 123; Gambia 125th; Nigeria 127; Mali 128; Madagascar 130; Malawi 132; Mozambique 133; Burkina Faso 135; Sierra Leone 138; Burundi 139; Angola 140; Chad 143; Guinea 144.


GCI Ranks (2014-2015)
160
140
120
100
80
60
40
20
0
39
56
62
74
79
88
90
96
106
107
111
112
115
116
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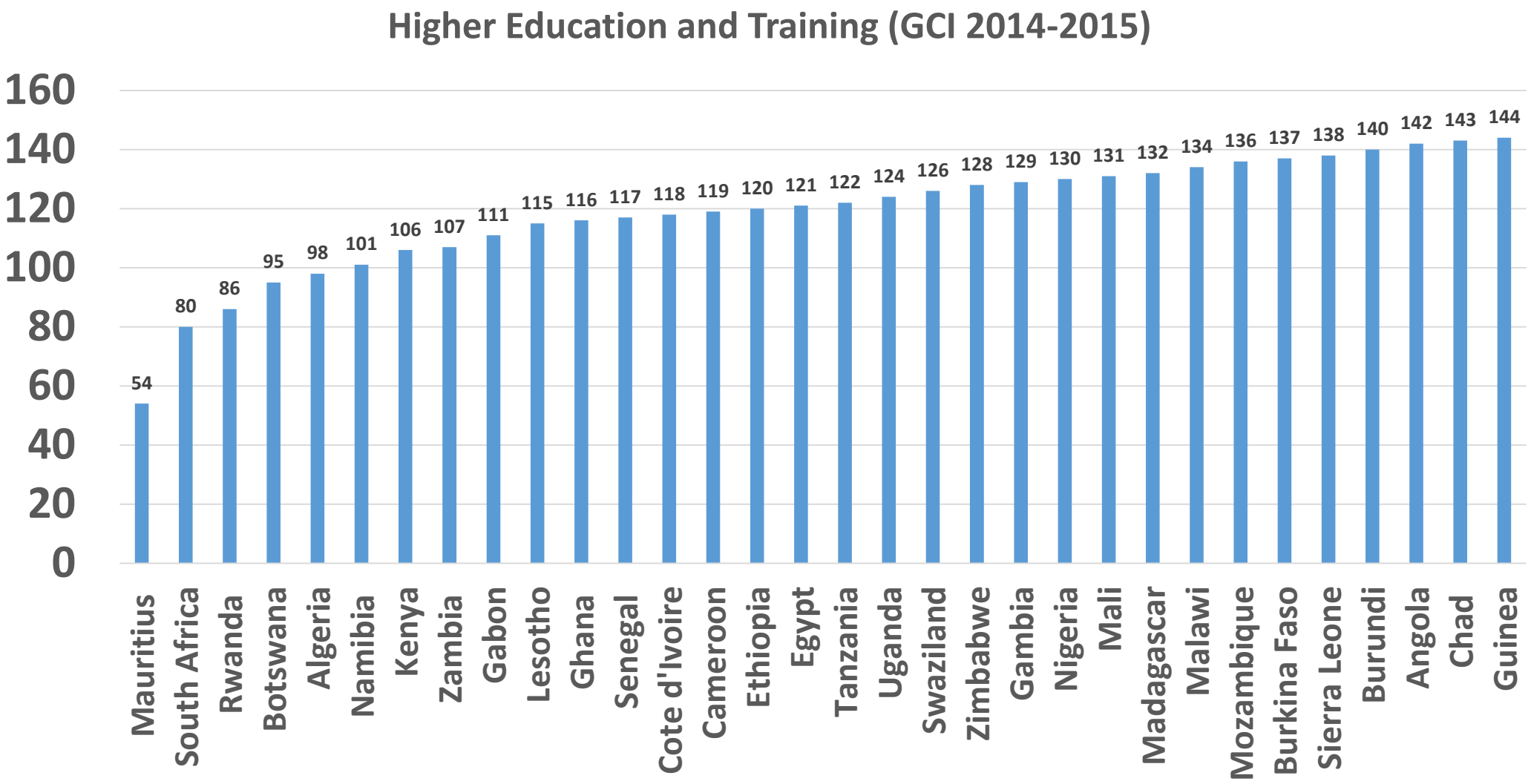
128
130
132
133
135
138
139
140
143
144
Mauritius
South Africa
Rwanda
Botswana
Algeria
Namibia
Kenya
Zambia
Gabon
Lesotho
Ghana
Senegal
Cote d'Ivoire
Cameroon
Ethiopia
Egypt
Tanzania
Uganda
Swaziland
Zimbabwe
Gambia
Nigeria
Mali
Madagascar
Malawi
Mozambique
Burkina Faso
Sierra Leone
Burundi
Angola
Chad
Guinea


Higher Education and Training (GCI 2014-2015)
160
140
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100
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0
54
80
86
95
98
101
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107
111
115
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Mauritius
South Africa
Rwanda
Botswana
Algeria
Namibia
Kenya
Zambia
Gabon
Lesotho
Ghana
Senegal
Cote d'Ivoire
Cameroon
Ethiopia
Egypt
Tanzania
Uganda
Swaziland
Zimbabwe
Gambia
Nigeria
Mali
Madagascar
Malawi
Mozambique
Burkina Faso
Sierra Leone
Burundi
Angola
Chad
Guinea

Pillar 5 -> Higher Education and Training

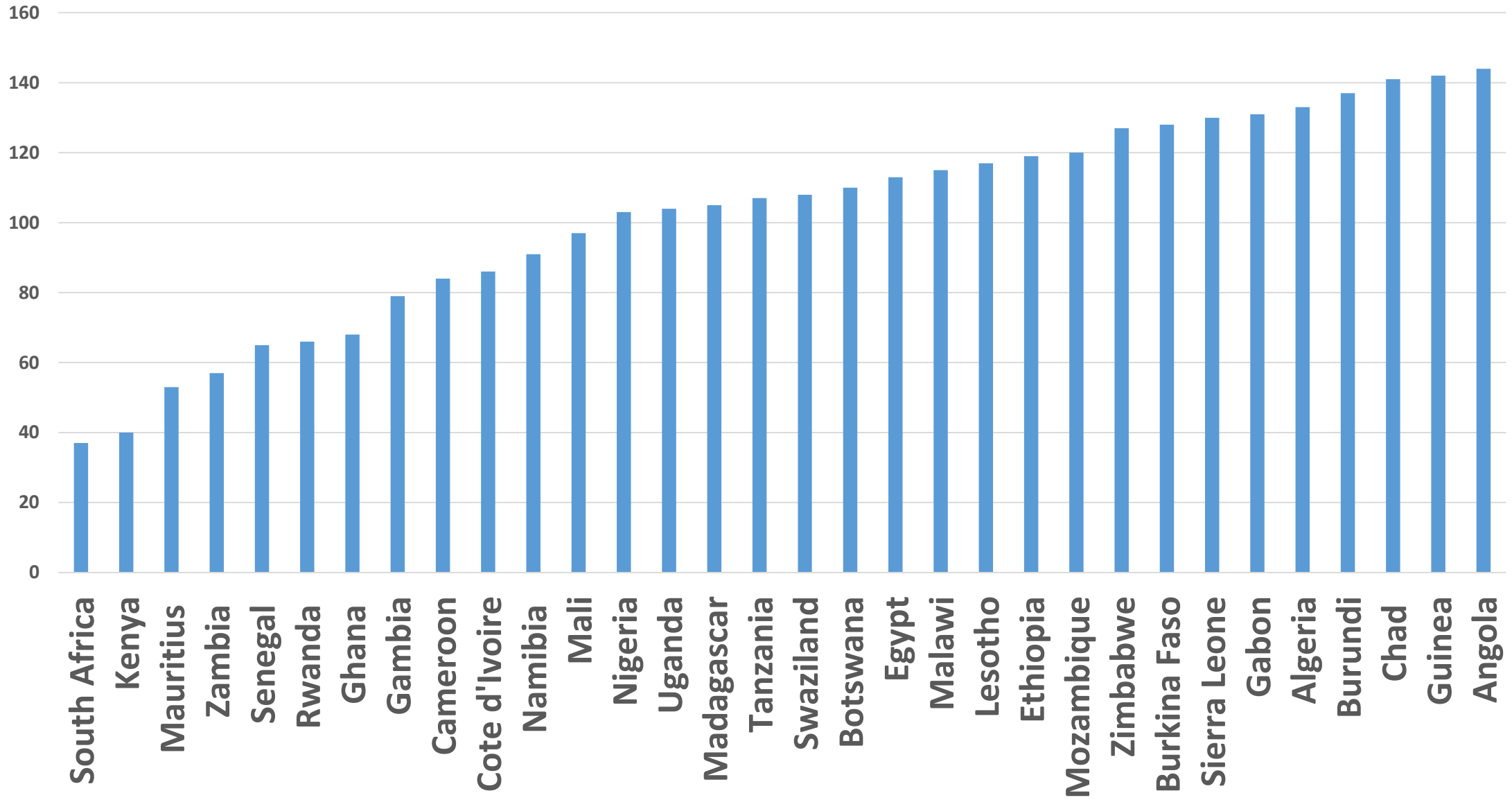
- Quality higher education and training is crucial for economies that want to move up the value chain beyond simple production processes and products.
- Globalization of the **economy requires countries to nurture pools of well-educated workers who are able to perform complex tasks and adapt rapidly to their changing environment and the evolving needs of the production** system.
- **Inputs into pillar 5:**

➢ **Secondary and tertiary enrolment rates as well as the quality of education as evaluated by business leaders.**

➢ **Extent of staff training and importance of vocational and continuous on-the job training—which is neglected in many economies—for ensuring a constant upgrading of workers' skills.**

***Funding Framework for Universities is needed in Africa! SA funding model for HEIs is recommended.**

Innovation and Sophistication factors (2014-2015)



Role of Higher Education Institutions?

- Educating the Masses with “Fit for Purpose Skills”. (WEF 2014-15)

Against this backdrop, policymakers as well as business and civil society leaders must work together in order to ensure robust economic growth that supports more-inclusive economies.

“Education beyond artificial borders with less emphasis on political, economical, social and ethnic agendas”.

Strong HEIs, High calibre talent and high capacity to Innovate -> a successful economy.

.We can no longer ignore what is happening in neighbouring states as it impacts on us (positively or negatively)!

Company Spending on R&D (GCI, 2014-2015)

RANK, COUNTRY, ECONOMY

1. Switzerland -5.9
2. Japan - 5.8
3. Finland - 5.7
4. United States- 5.5
5. Germany - 5.5
6. Sweden - 5.4

…….

28. Kenya -3.8
48. South Africa – 3.4
49 Zambia - 3.4

Availability of Scientists and Engineers GCI (2014-2015)

1. Finland -6.2
2. Qatar -5.6
3. Japan – 5.4
4. Greece -5.4
5. United States- 5.3

……

44. Kenya – 4.4

51. Zambia – 4.3

102 South Africa -3.5

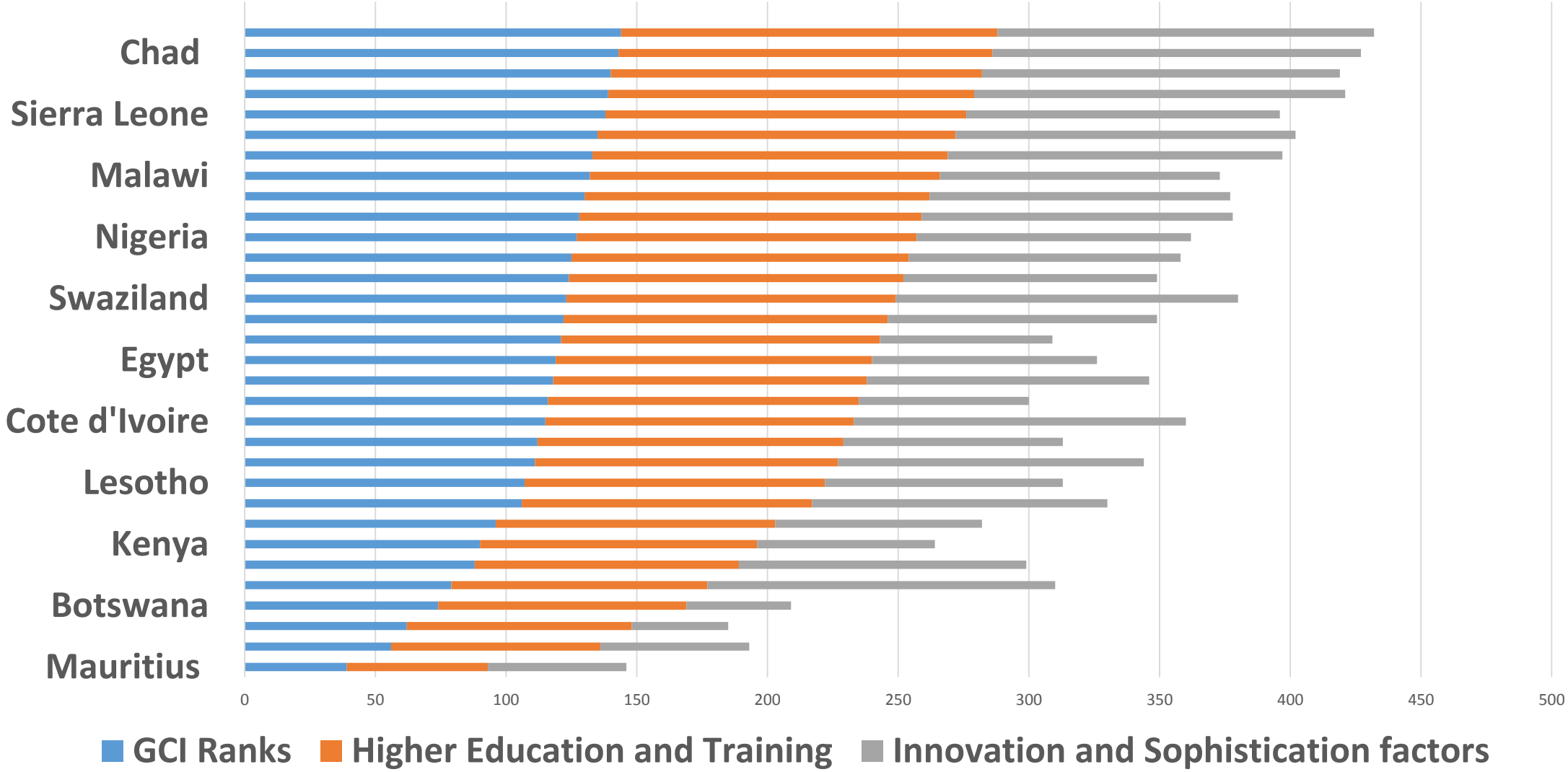
103 Malawi - 3.5 .

Baseline Inputs

- **Peace and Security**: Stabilization in geopolitical conflict and turbulence (impact on education, research, innovation and human capital: Large parts of North Africa, sub-Saharan Africa: ethnic divisions, xenophobia etc).
- **Inclusive growth t**o extend to larger population including women and people living with disabilities: Sub-Saharan Africa registered 5% growth rates in 2013. **Only one in two young Africans participates in wage-earning jobs.**

***High population growth – by 2020 half of the continents population expected to below 25 years (See GCI 2014-2015).**

GCI, HE & Training, Innovation & Sophistication



GCI Indicators (Inputs)

Quantity of Education

- Secondary education enrolment rates;
- Tertiary education enrolment rates;

Quality of Education

- Quality of education system
- Quality of maths and science education
- Quality of the management of schools
- Internet access in schools

On the job training

- Local availability of specialized research training
- Extent of staff training

Baseline Output: Brain drain/Brain gain/Social mobility:

"In the context of sustainable competitiveness, it is crucial that subsequent generations can improve their condition regardless of the socioeconomic status of their parents. ….. the absence of such social mobility can be detrimental to human capital development causing talented individuals, in a society that does not allow them to access education or to move ahead who may not be leveraged for economic advancement to …. leave their home country to pursue opportunities abroad" (GCI, 2014-2015).

* High Youth unemployment social risk…..

In Human Capital Theory:

- The causes of brain drain are generally understood according to a push-pull theory.
- Push factors: unfavourable conditions in Africa that motivate people to leave. They include, among others, job scarcity, low wages, crime, armed conflicts, political repression, and poor educational systems.
- Pull factors: favourable conditions in the receiving countries that help Africans decide to leave (El-Khawas, 2004).

***Before 2004.. there were more Africans working in the US as scientists and engineers than they were in Africa (?).**

Building a Knowledge Economy in South Africa (Blankley and Booyens, 2010)

R & D Innovation

Capacity for innovation

Quality of scientific research institutions

Company spending on R&D

University-industry collaboration in R&D

Government procurement of advanced technology products

Availability of scientists and engineers

PCT patent applications

Intellectual property protection

Baseline Information

"The *Draft Declaration and Action Plan of the 1st African Higher Education Summit on Revitalising Higher Education for Africa's Future* confirmed commitment to creating a continental multi-stakeholders' platform to identify strategies for transforming the sector……." (University World News, 13 March 2015 Issue No:358) .

- Radical Expansion of Higher Education (HE) to achieve an enrolment ratio **of 50% within 50 years**;
- More investment in HE and Research;
- Improved graduate employability;
- Enhanced diversification, differentiation and harmonisation at all levels by countries.

“The summit further called for support for emerging research universities, 200 ‘hubs of excellence’ universities, all academics to have PhDs by 2063, and gross expenditure in research of 1% within five years and 5% by 2063”.

***Baseline Information: what are the participation rates per gender in HE in Africa?**

Current Challenges

- Higher Education Growth due to:

➢Population Increase and Increase in demand for HE

➢Economic growth and demand for skilled labour

➢Increase in private higher education providers (~2000 HE providers)

➢Inadequate infrastructure, funding, scholarly productivity and global competiveness, poor quality.

*Inadequate sources of segregated data on participation rates and progression rates for the continent in HE (?).

(see http://www.chet.org.za/data/african-he-opendata)

"An Empirical Overview of Eight Flagship Universities in Africa 2001–2011 is the second publication in which the Centre for Higher Education Transformation's Higher Education Research and Advocacy Network in Africa (HERANA) project reports on the collecting and analysis of crossnational higher education data for a group of eight 'flagship' universities in Africa".

HERANA institutional participants

- University of Botswana
- University of Cape Town
- University of Dar es Salaam
- Eduardo Mondlane University
- University of Ghana
- University of Mauritius
- Makerere University
- University of Nairobi

*8 Universities selected for this project (Bunting et al., 2014).

Some findings from the project:

- Individual growth rates differed widely; ranging from high average annual growth rates of:
- 13% for Ghana, 12% for Eduardo Mondlane , 10% for Nairobi, to more

moderate growth rates of 6% for Mauritius, 4% for Cape Town, 3% for

Botswana and 2% for Makerere.

- The eight universities remained primarily undergraduate institutions

throughout the period 2001 to 2011. Only Cape Town had a postgraduate

proportion above 30% in 2011.

*DUT 97% (UG); 3% (PG).

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Remark:

Economic Growth in Sub-Saharan Africa is associated with:

- low/poor schooling, political instability, underdeveloped financial systems, distorted foreign-exchange markets, high government deficits and inadequate infrastructure.

.Africa's high ethnic fragmentation explains somet of these features (see 1997 paper (Easterly and Levine, 1997)). Still relevant today.

What has changed and who is measuring what?

- Acknowledgements:

Collaborator: Dr Bloodless Dzwairo - Durban University of Technology.

Thank You!