



**CHET**

CENTRE FOR HIGHER EDUCATION TRANSFORMATION

# Africa Needs Research Universities

## Knowledge Production in Eight African Flagship Universities

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# The Functions of Higher Education

1. The importance of knowledge and higher education for sustainable development is **global**, even though there are **contextual and regional** differences
  2. It is the **knowledge re-generative capacity** of universities that underlies sustainable development
  3. **Four functions of universities:**
    - **Ideological apparatus:** producers of values social legitimation
    - **Selection of the dominant elites** –iron cage for the elite
    - **Professional training** – self programmable labour
    - **Production of scientific knowledge** – engine of development
- (Manuel Castells: The University System: Engine of Development in the New World Economy, 1993)

# Africa Needs Research Universities

1. Traditionally, Universities in Africa focussed on Ideology, Elite Selection and Training, and performed poorly on **Knowledge Production**
2. Africa needs to shift to **increased participation** (from low base of under 10% ) and **increased knowledge production**
3. Research universities in low- and middle-income countries have crucial roles to play in developing differentiated and effective academic systems
4. Understanding the characteristics of the research university and building the infrastructures and the intellectual environment needed for successful research universities is a top priority (Altbach, 2013)

# Africa's Research Performance

Dominance of Global North declining and rising for emerging economies;

1. North America's share of global research and development declined from 37.9% in 1994 to 28.9% in 2013
2. Europe's fell from 31.4% to 22.7%;
3. Asia increase from 26.6% to 42.2%
4. Latin America and the Caribbean from 1.9% to 3.5%
5. Africa from 0.9% to 1.3%,
6. If the African Union were a country, it would be just behind India, China and Brazil, but ahead of Russia in publication output.
7. African Union publication output grew by **43%** compared to the world average of 18% (Source: Scopus).
8. If the African Union were a country, it would be just behind India, China and Brazil, but ahead of Russia in publication output.

Sources: African Observatory for Science, Technology and Innovation;  
Zaleza P. 2014. *The Development of STEM in Africa*.

# Capacity constraints & challenges facing Africa

Zaleza (2014) highlights four key issues:

1. Link STI to industry and National Development Plans with stable funding and implementation.
2. Massive expansion and support for HE required.
3. Incentivise the business sector for industry–university collaborations.
4. Promote scientific literacy to popularise STI in society.

# Capacity constraints & challenges facing Africa

1. The underlying assumption of Zeleza's synthesis is, **More for Everybody**, because in Africa no government or university sector wants to openly promote differentiation.
2. Research universities are a small percentage of the HE system:
  1. US 5% (220 from 4000)
  2. China 3% (100 from 3000)
  3. UK 25% (25 from 100)
3. Many smaller developing countries only have one research intensive university and many none (Altbach 2013).

- Network of 50 participating academics and senior administrators (mainly planners) in 12 countries
- Project is currently in its 7<sup>th</sup> year
- Participating African countries and “Flagship” universities
  - Botswana – University of Botswana
  - Ghana – University of Ghana
  - Kenya – University of Nairobi
  - Mauritius – University of Mauritius
  - Mozambique – Eduardo Mondlane
  - South Africa – University of Cape Town
  - Tanzania – University of Dar es Salaam
  - Uganda – Makerere University

# Africa needs data (on higher education)

1. “We need empirically-based, data-informed decision-making in Africa in order to improve governance and productivity.” Kofi Annan at the Higher Education Summit, Dakar, March 2015.
2. HERANA has collected data on students, staff and publications from 2001 to 2015 at all universities participating in HERANA.
3. Standardised reporting and a data manual have been developed.
4. Data is being transferred to a online data management system.
5. Data published as open data: free to access and reuse.





## Edit Research Data

Publication Type

Year

Title

PQM

Language

Document Type

Publication Name

Digital Object Identifier (DOI)

Data Source

Source

Funding Agent & Grant Number

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### Research Data

Show 10

Year	Publ
2014	Journ
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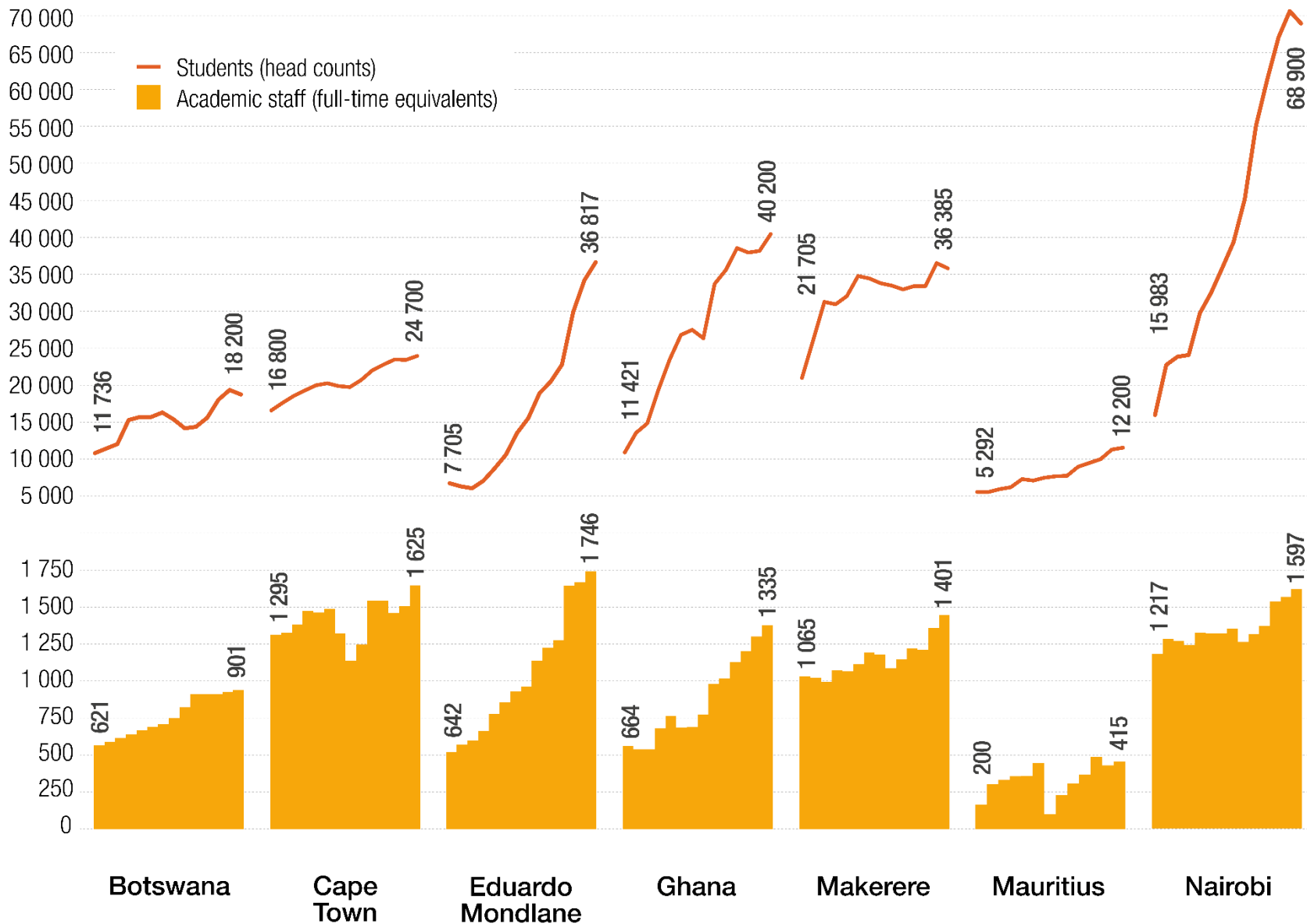
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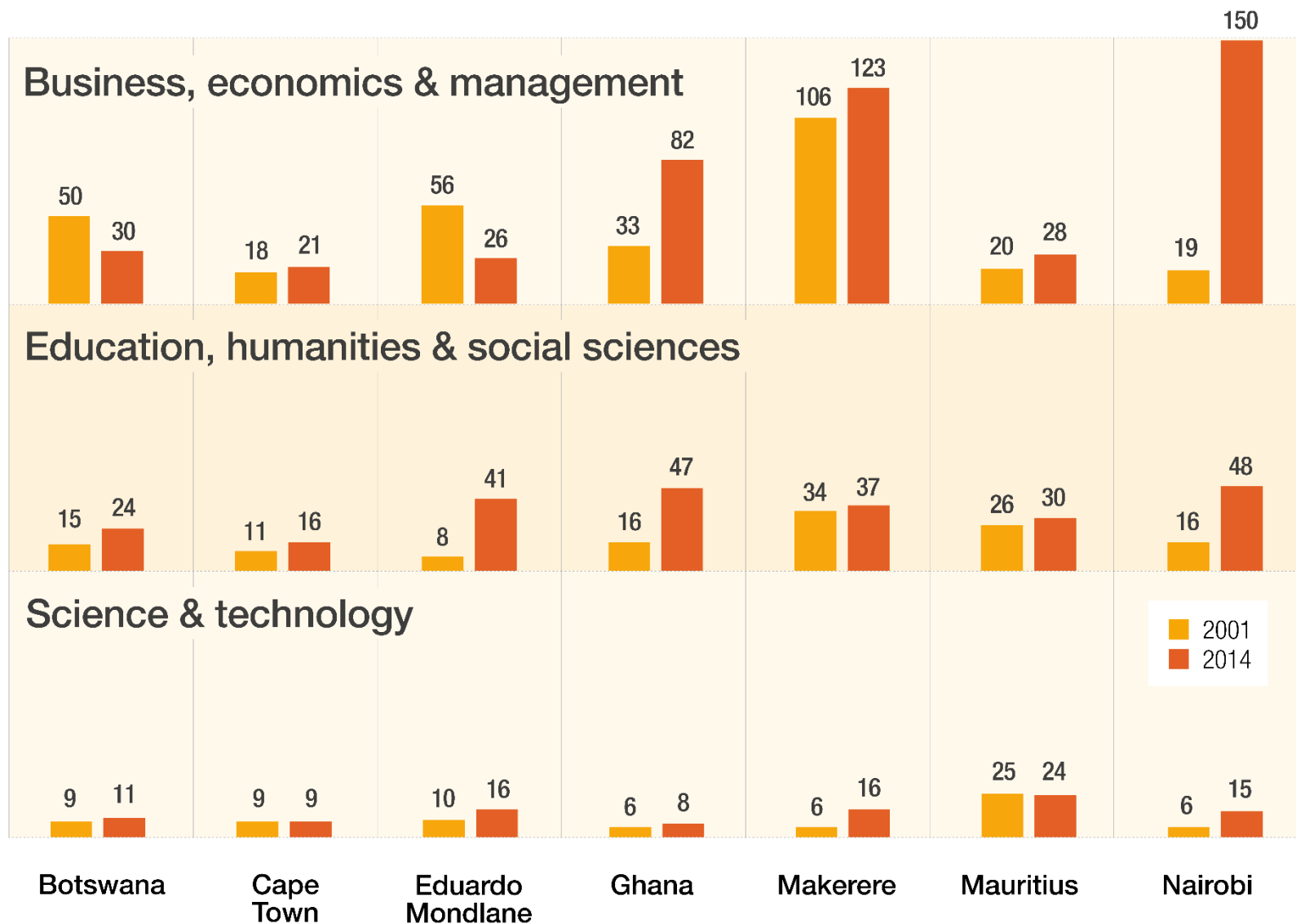
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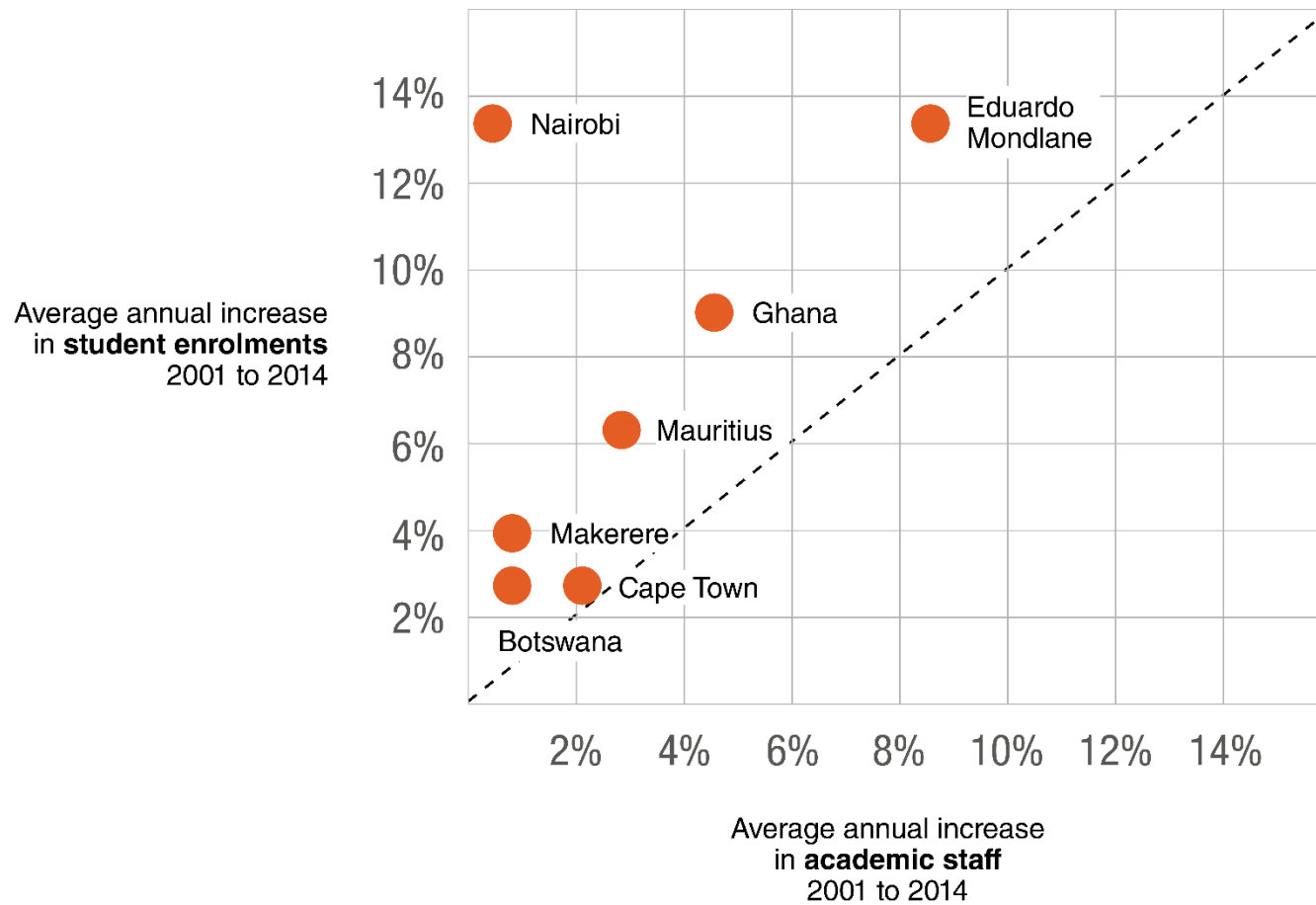
# Student enrolments and academic staff: 2001–2014



# Ratio of FTE students to FTE academics by major fields of study: 2001 vs 2014



# Growth in enrolments and academic staff 2001–2014



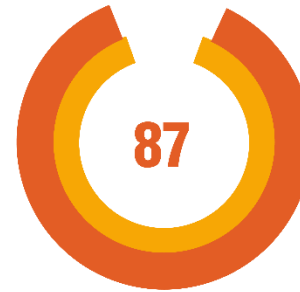
# % of undergraduate enrolments: 2001 vs 2014



Cape  
Town



Nairobi



Ghana



Botswana



Mauritius



Makerere



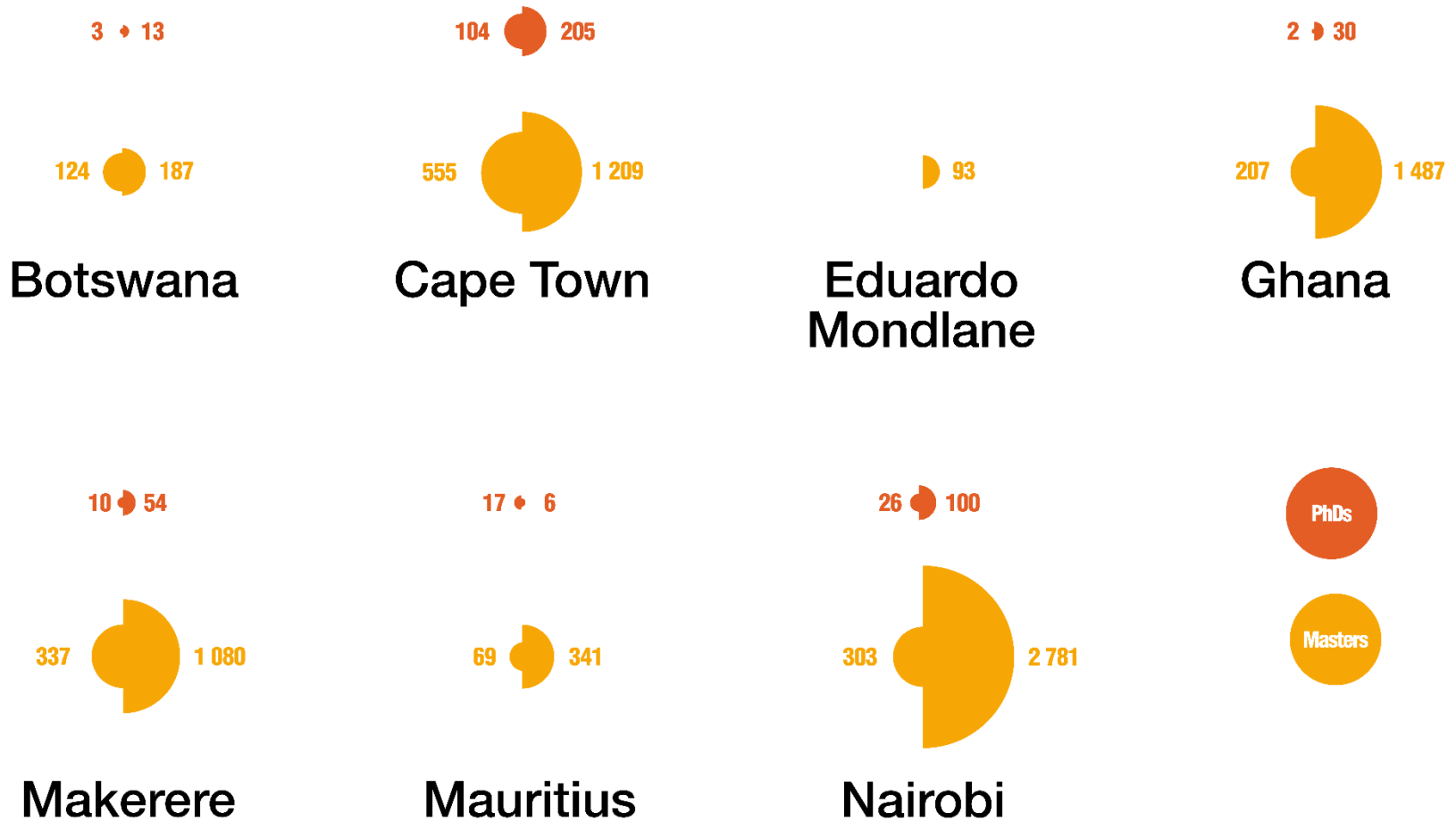
Eduardo  
Mondlane

Average decrease  
in undergraduate enrolments  
as percentage of total  
head count enrolments for  
2001 to 2014

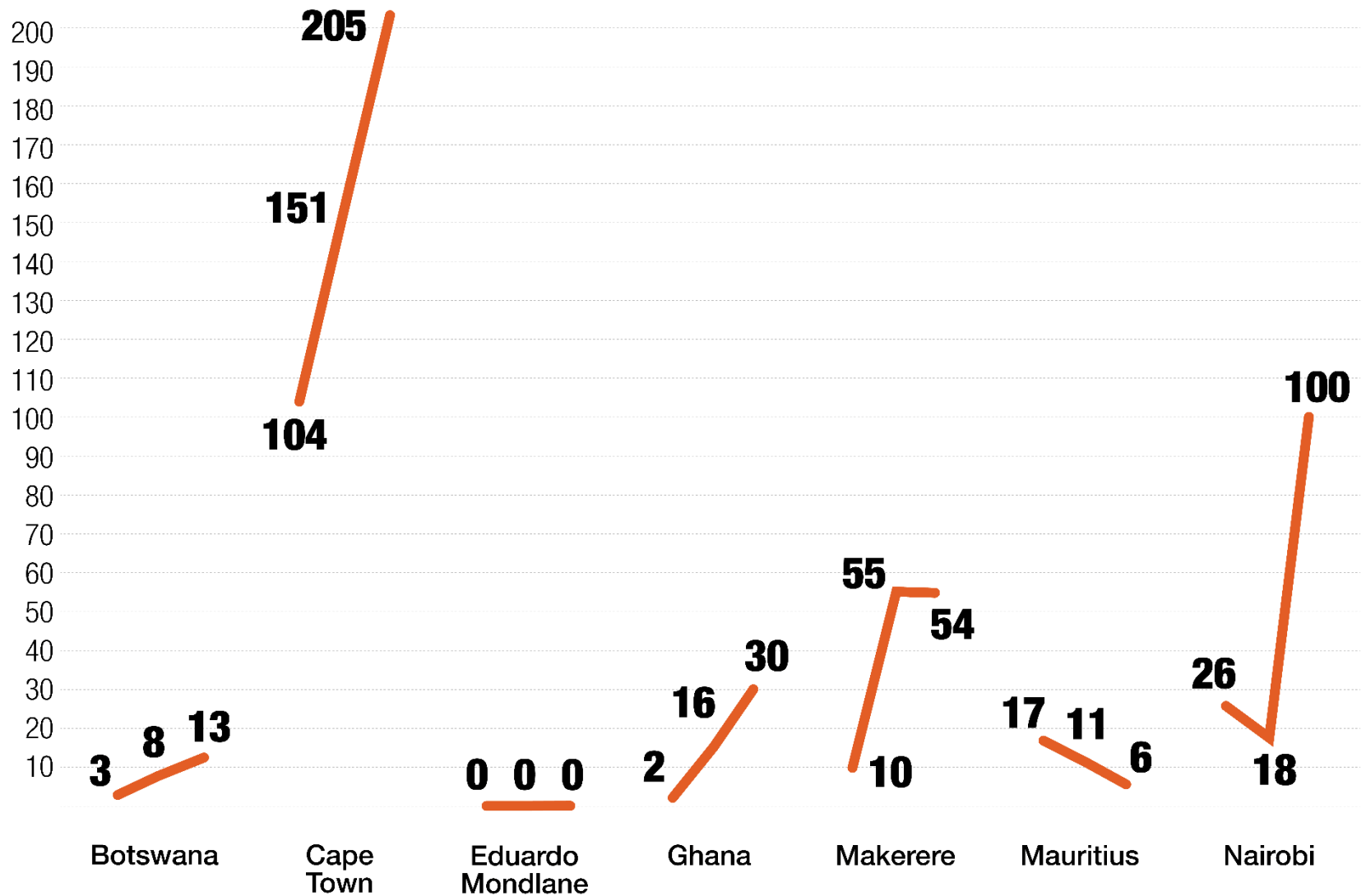
**-20%**



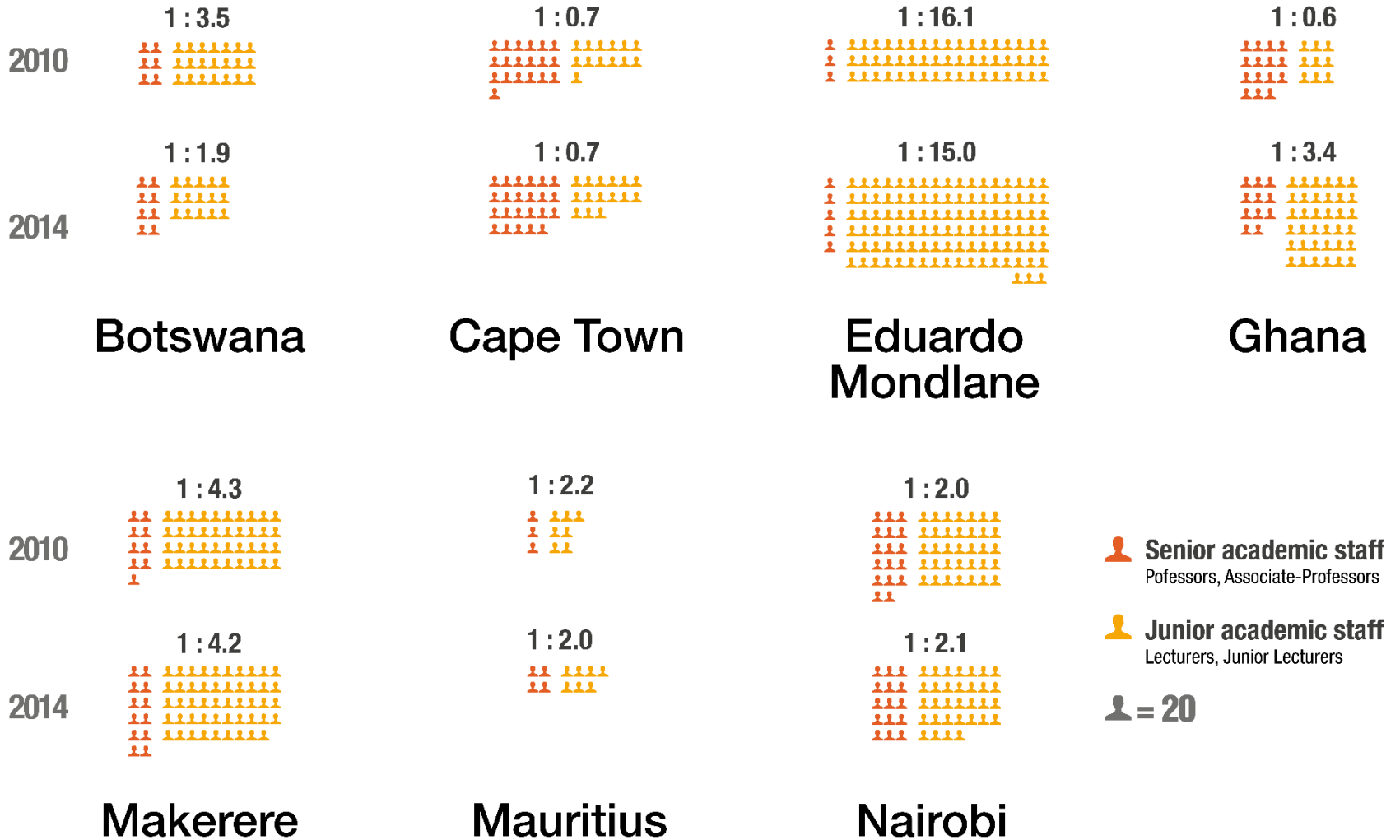
# Masters and doctoral graduates: 2001 vs 2014



# Doctoral graduates: 2001, 2009, 2014

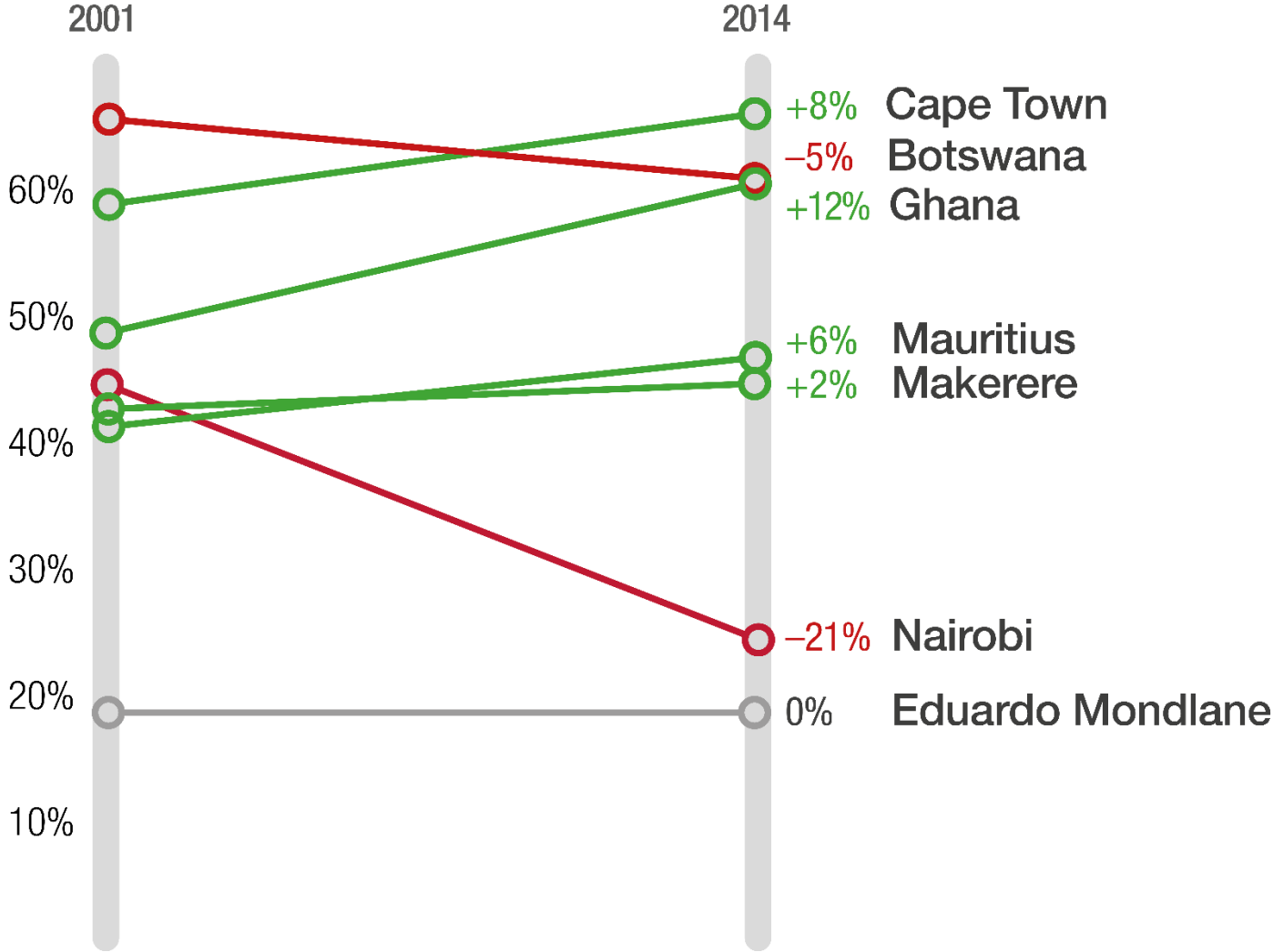


# Senior and junior academic staff: 2010 vs 2014

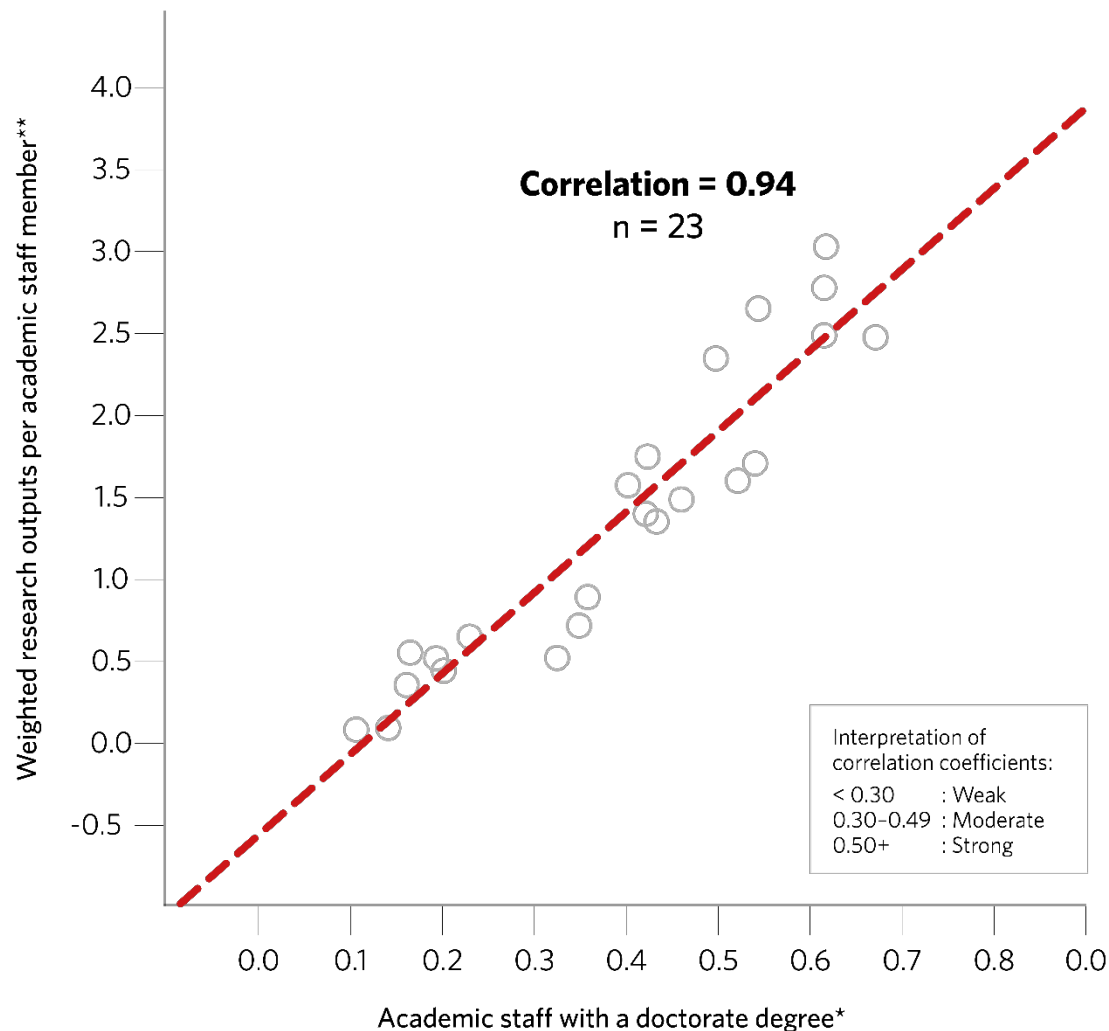




# % of academic staff with PhDs: 2001 vs 2014



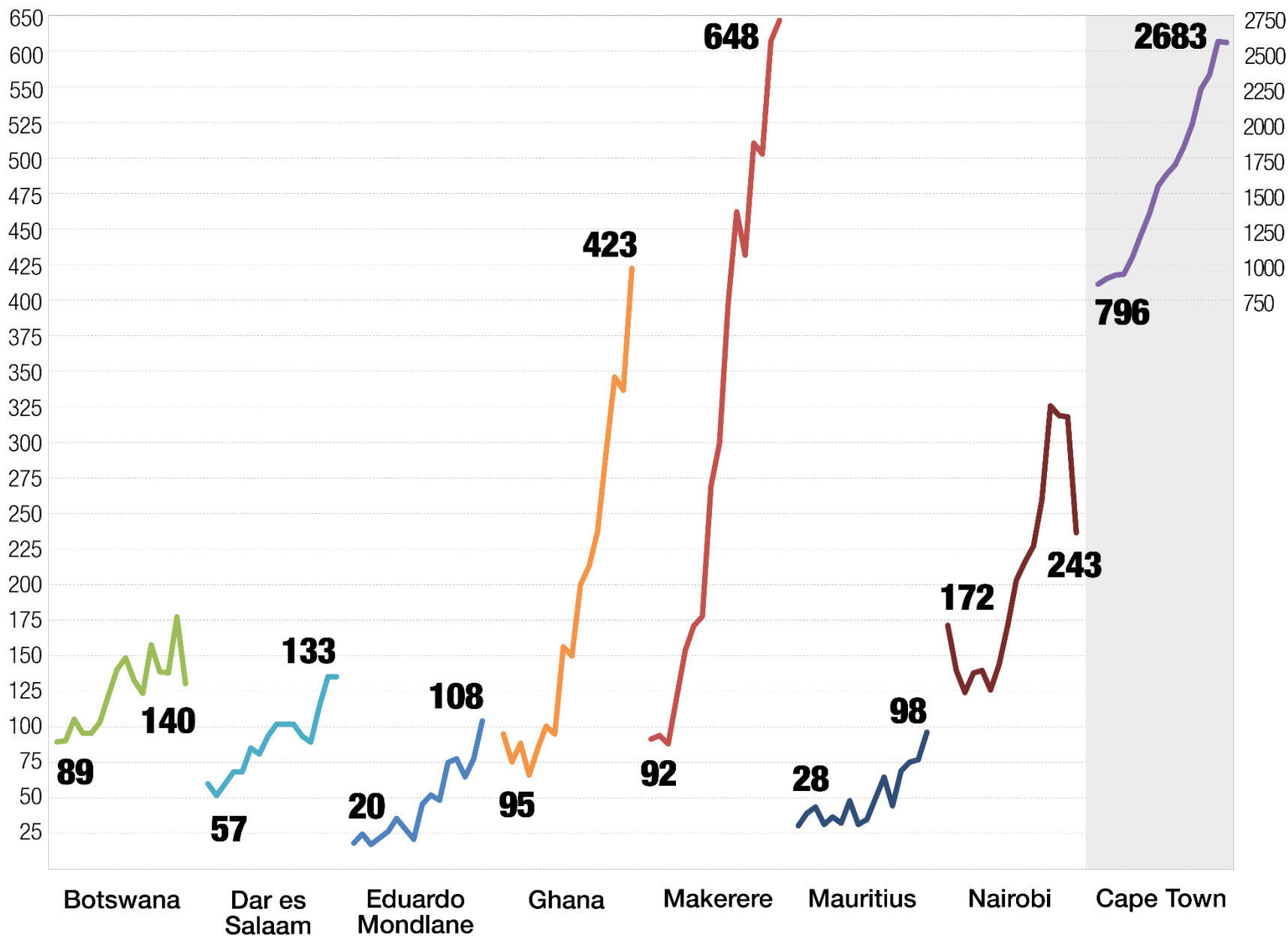
# Correlation between % of staff with doctorate and research outputs (2014)



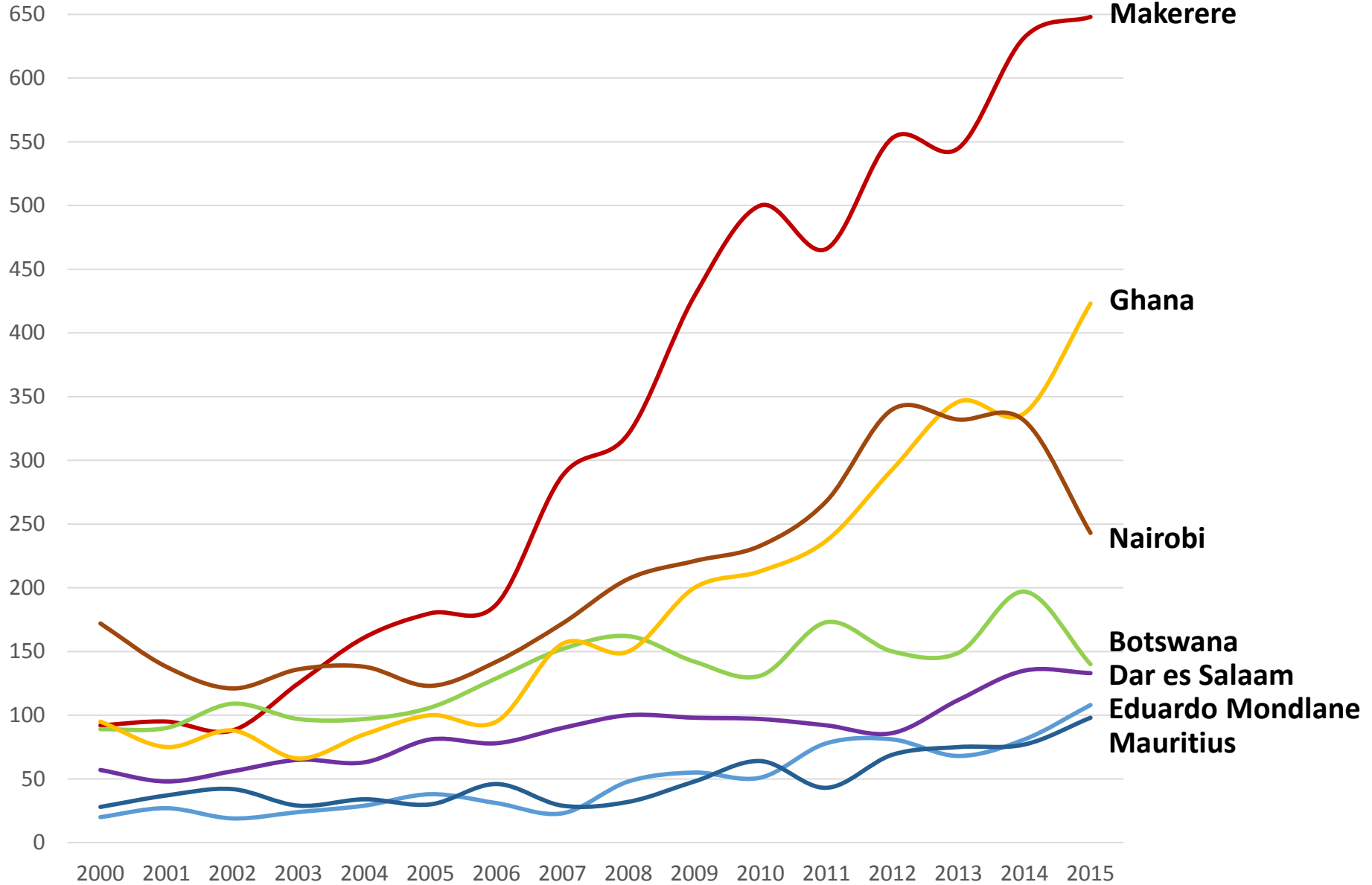
Analysis was done on 23 South African public universities, excluding the three new public universities. Calculations are based on the 2014 HEMIS data obtained from the DHET.

NOTES: \* **Academic staff** are employees who spend at least 50% of their official time on duty on teaching and/or research activities.  
\*\* **Weighted research outputs:** The research outputs recognised by the funding framework are research publication units (weighting = 1), research masters graduates (weighting = 1), and doctoral graduates (weighting = 3).

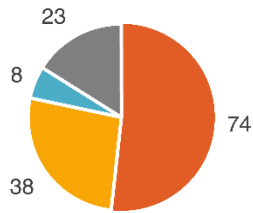
# Journal articles published in WoS: 2000–2015



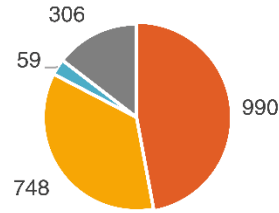
# Journal articles published in WoS 2000-2015 (excluding Cape Town)



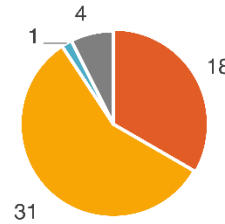
# Research publications by major fields of study: 2014



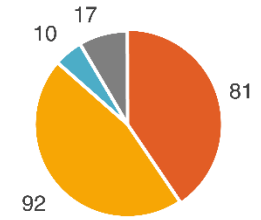
**Botswana**



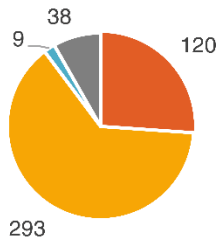
**Cape Town**



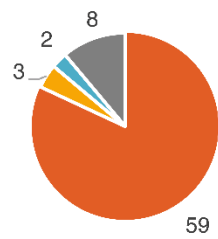
**Eduardo  
Mondlane**



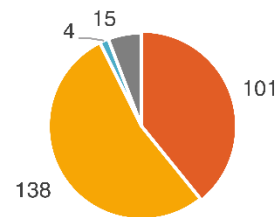
**Ghana**



**Makerere**



**Mauritius**



**Nairobi**



# Conclusions / Implications

1. Only UCT could be regarded as fulfilling the criteria for a research intensive university, with Makerere moving in that direction
2. The flagship universities are not strong enough to participate in global networks
3. Greater emphasis on institutional reforms being **research** (evidence) informed rather than by inspirational Goal and Vision statements
4. To strengthen research intensiveness, HERANA is focusing on the knowledge-producing structure of the university and studying incentive regimes (direct and indirect).

# Characteristics of research universities

1. Mission/ Vision and Knowledge Production Strategy
2. FTE Staff-Student ratios (faculty differentiation).
3. Ratio of undergraduate to postgraduate.
4. Masters-doctoral ratio (research masters).
5. Doctoral enrolment and graduation (model of PhD production).
6. Staff qualifications (% with PhD) and Seniority (% of professors).
7. Publication profile (international or local; books, articles, international conferences).
8. Knowledge production incentive/disincentive regime.
9. Pact – agreement between institution (at different levels and faculties) and government.

1. *The ability to manage contradictory functions while emphasizing the universities' role in generating knowledge and training labour in the context of the new requirements of the development process will to a large extent determine the capacity of countries and regions to become part of the new world economy. (Castells, 2009)*
2. One university cannot alone resolve the contradictions, a country must at least have a national research system that also includes a diversity of universities and other types of higher education institutions, private sector and public research centres, and private sector research and development.
3. Higher education policies have become increasingly coordinated with other policy areas, such as innovation and technology, as part of national (and supranational) knowledge and innovation policies (Braun, 2008)
4. A university cannot become research led (or intensive), or world class, if it is not part of a national and policy framework with differentiation.



# Doctoral Education in South Africa

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Nico Cloete, Johann Mouton & Charles Sheppard

## **Doctoral Education in South Africa**

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AFRICAN HIGHER EDUCATION DYNAMICS SERIES VOLUME 1

# KNOWLEDGE PRODUCTION & CONTRADICTORY FUNCTIONS IN AFRICAN HIGHER EDUCATION

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## Data from CHET, CREST & African HE Open Data

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



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