Sustainable Development in Africa through Science, Technology and Innovation
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Define tomorrow.

145
145 years
of lighting the way

UNISA | college of science, engineering and technology

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Some Facts about our Continent

- Population (Africa) - 1,216 billion expected to grow to 2.4 billion by 2050
- 15% of the Global population expected to increase to 25% of the population
- Produce only 3% of Global GDP
- 2% of the world research output
- Life expectancy has increased to 72 years
- 60% of the population is youth aged between 24 and younger

The Role of Science, Engineering and Technology
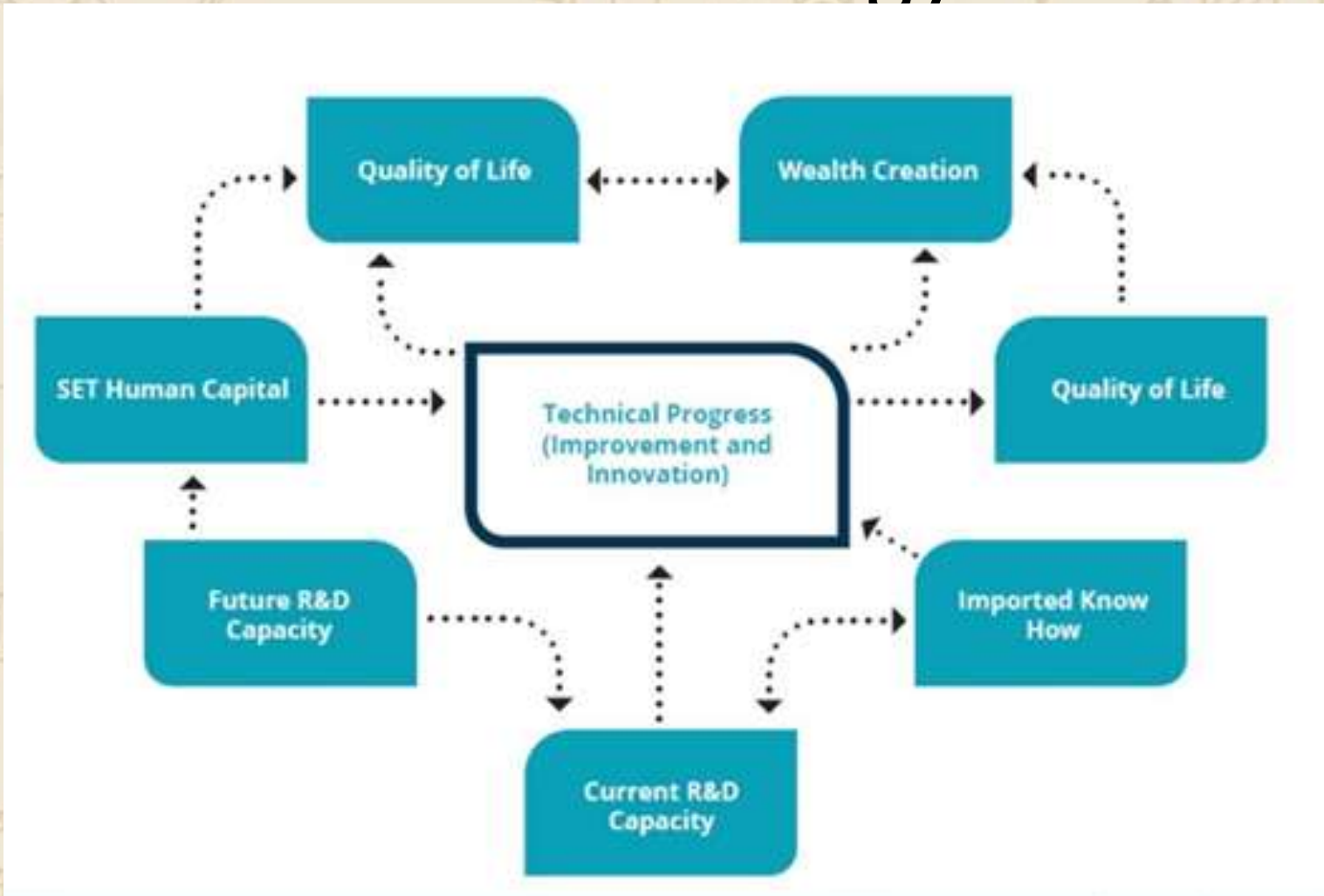
Priority for Africa

- Eradicate hunger
- Prevent and control diseases
- Communication
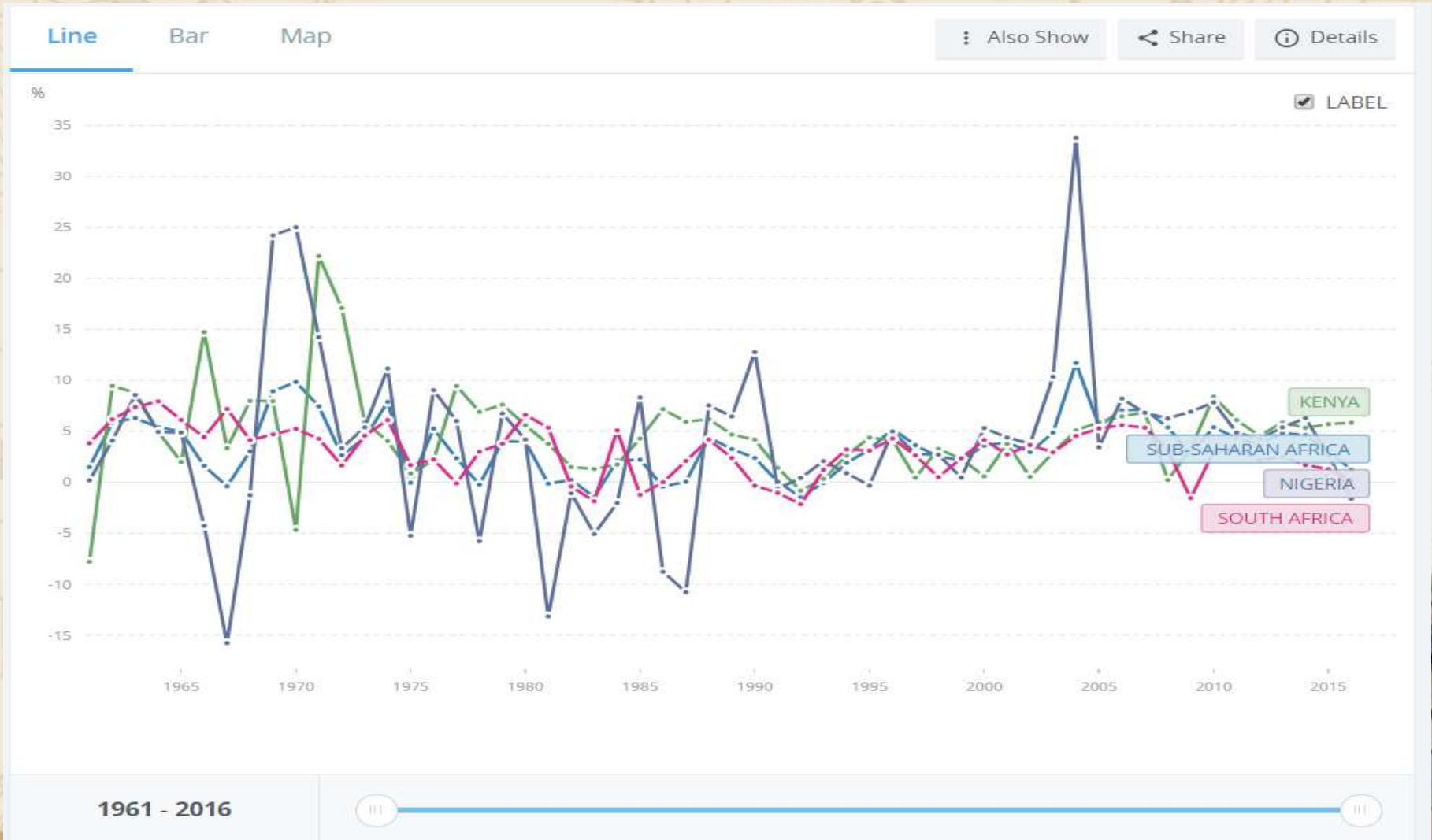- Protect our space
- Live together
- Create wealth

STISA-2024

Global Competitiveness Table

Country Positions	Economy	Score
1	Switzerland	5.81
8	Japan	5.48
24	Israel	5.18
28	China	4.95
39	India	4.52
45	Mauritius	4.49
47	South Africa	4.47
52	Rwanda	4.41
64	Botswana	4.29
84	Namibia	4.02
96	Kenya	3.90
99	Cote d'ivoire	3.86

Gross Domestic Product Data

Innovation, Research and Development GERD/GDP

The impact of SETI Investment

Low to middle income level countries

Primary/ Secondary education

Relationship between GDP and R&D expenditure In SA

Lee and Mathews 2013

The impact of SETI Investment

Middle to high income level countries

Tertiary Education and Technological innovation

Relationship between the country GDP and R&D expenditure

The impact of SETI

Brazil and Argentina

1.16 2013, 0.76 % 2010 of GDP

Sustainable Economic Growth

The impact of SETI investment

Korea and Taiwan

About 1.4% GPD

Sustainable Economic Growth

Disruptive technology

- Kodak with digital photos

Technology: Digital photos

Disruptive technology

- Uber and Taxi meters

Technology: App Development

Disruptive technology

- Black Berry and iPhone

Technology : Touch Screen

Disruptive technology

BITCOIN

ACTUAL RAND AND CENTS

Technology: Digital Money

Example of Sustainable development by SETI in Africa

- Mobile Technology Mpesa Kenya

The Role of higher education in sustainable development of Africa

- Capacity Development

- Knowledge Generation

What should we be teaching

- Undergraduate
  - Problem solving skills
  - Analytical skills
  - Numeracy
  - Teamwork
  - Creativity
  - Writing
  - Research

Josh-Bersin 2017 July
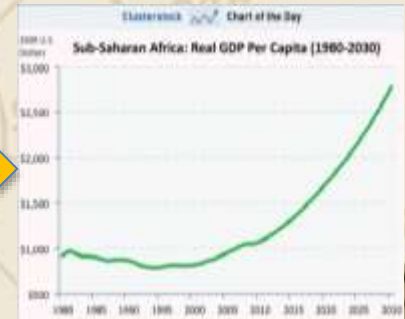
How can we make it happen

Primary education Quality

Increase capability of SET
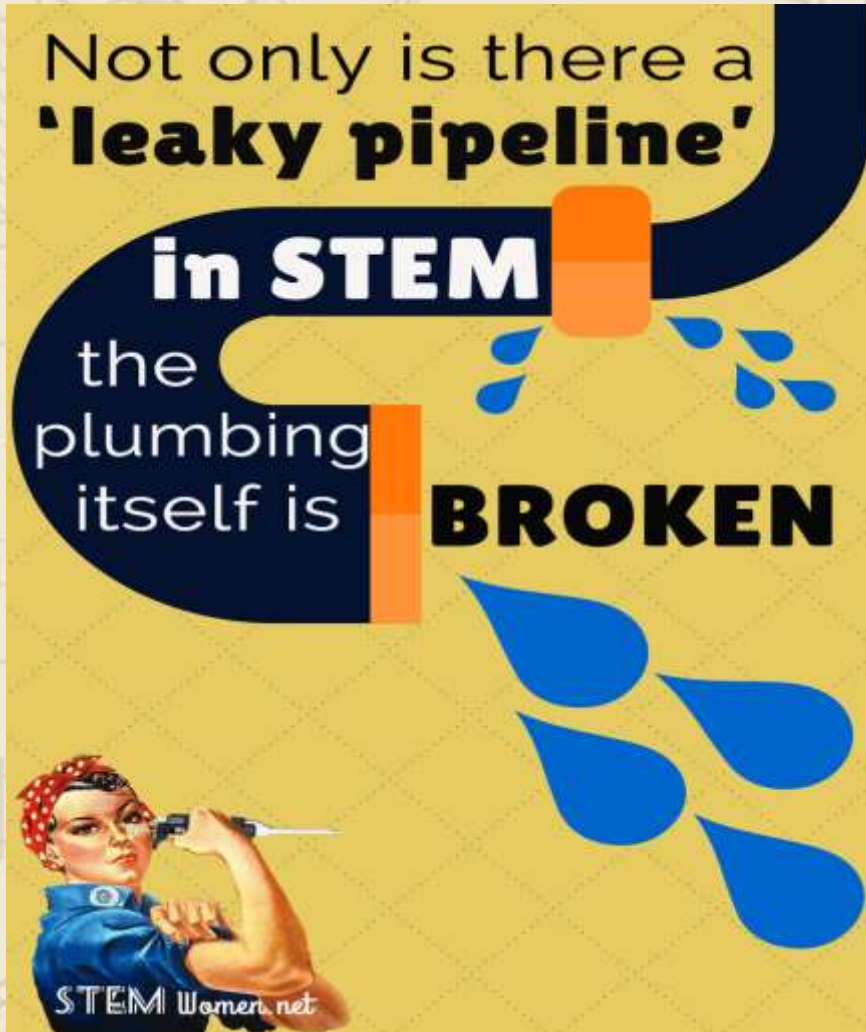
R&D

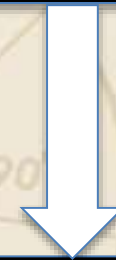Increase GERD Ratio from 0.78 to 1.4 by 2025

Increase Patents

Increase GDP

Policy Perspective

Not only is there a 'leaky pipeline' in STEM the plumbing itself is BROKEN

STEM Women.net

Strengthen the pipeline of STEP High School graduate

Move from Low income country to Medium Income Country

Policy Perspective

Increase R&D Investment

Strengthen R&D investment in Higher education and Research institutes

Move Africa from Low income country to High Income Country

Scare Skills in SA

- ## Top 10 scare skills
  - 1. Electrical engineer
  - 2. Civil engineer
  - 3. Mechanical engineer
  - 4. Quantity surveyor
  - 5. Programme or project manager
  - 6. Finance manager
  - 7. Physical and engineering science technicians
  - 8. Industrial and production engineers
  - 9. Electrician
  - 10. Chemical engineer

21ˢᵗ Century Careers

21ˢᵗ century careers

- Robotics
- Industrial ICT Specialist
  - combining expertise in electronics and ICT
  - (hardware/software)
- Biomechanics
- Automation, Bionics
  - Cover robotics, with emphasis on actuators (e.g. artificial muscles, limbs and organs), and perception/cognition aspects

21st century careers

- Green Energy
- Health Sciences
- Ocean economy
- Astronomy

21st century careers

- For TVET
- Programming
- Electronics
- Automation
- Mechatronics

Thank you

Define tomorrow.

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