



# ***Bridging the “Innovation Chasm”***

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## ***Innovation Policy Challenges in Africa and Opportunities for Partnership with Europe***



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# Overview of Presentation

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- **The Challenge:**
    - **Translating knowledge into new products and services**
  
  - **The Response:**
    - **Africa's Science and Technology Consolidated Plan of Action**
    - **Example: Efforts in South Africa**
  
  - **The Opportunity:**
    - **African – European innovation partnerships**
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# The Challenge

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*How to achieve the efficient transfer and application of new and existing, knowledge and technology, from research actors to the commercial / industrial / development sectors in the form of products and services which promote growth and development?*



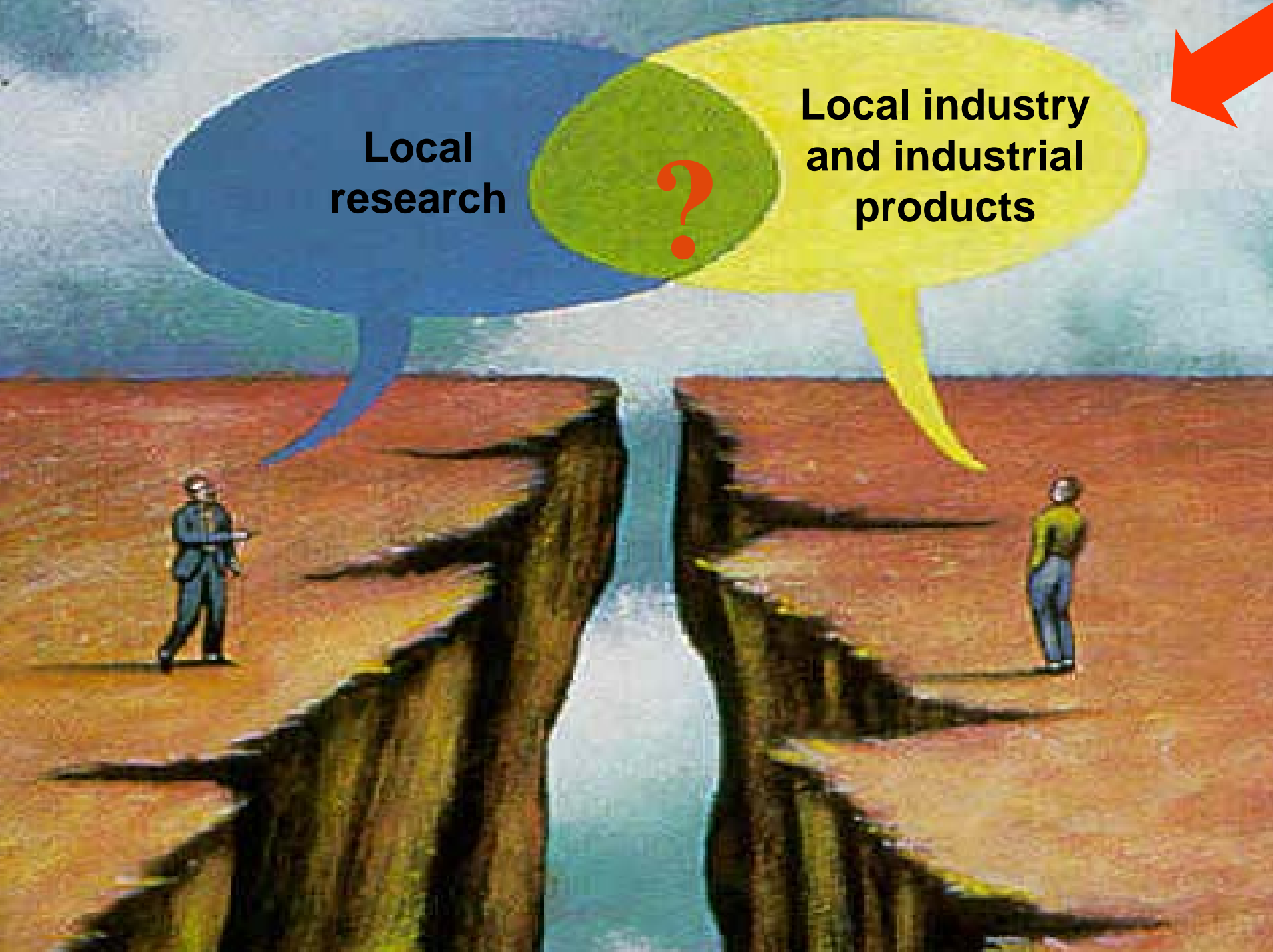
**Innovation**

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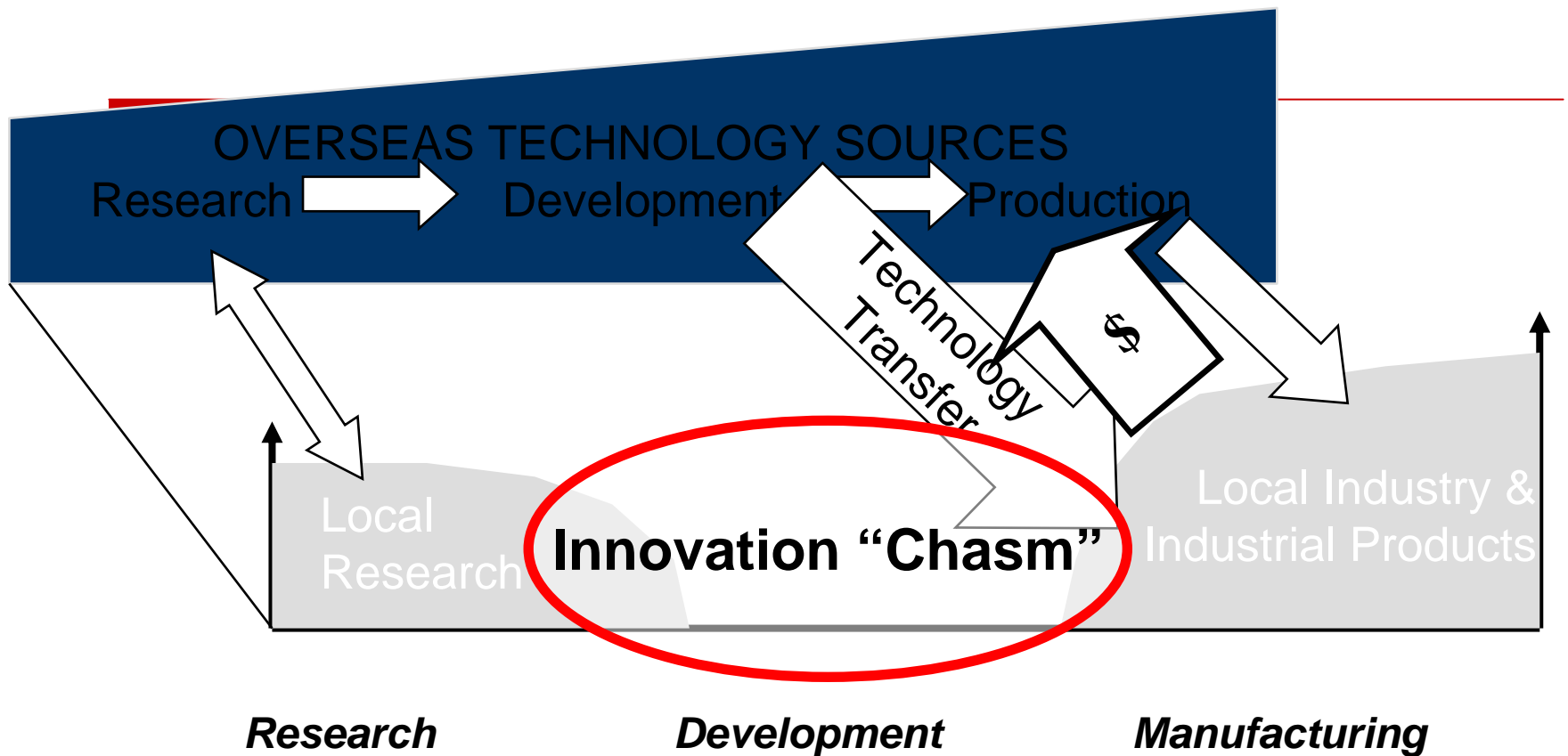
**Local  
research**

**?**

**Local industry  
and industrial  
products**



# Technology dependency or knowledge economy?



# The Innovation Challenge

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- Requires targeting and resources
  - Latter stages of innovation
    - Scale-up, product introduction, process engineering, new plant trials, etc. - ***risky and expensive***
  - Innovation Missions (funding and support)
    - Technological innovation
    - Demonstration for technology
    - Incubation new businesses
    - Networks of knowledge workers and firms
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# The African Response

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- African Ministerial Council on Science and Technology (AMCOST) in September 2005 adopted in Dakar, “Africa’s Science and Technology Consolidated Plan of Action”



**Capacity  
Building**

**FLAGSHIP R&D  
PROGRAMMES**

**POLICY SUPPORT  
AND INNOVATION  
MECHANISMS**

**Knowledge  
Production**

**Biotechnology  
and Indigenous  
Knowledge;**

**African Science and  
Technology and  
Innovation Indicators  
Initiative;**

**Energy, Water  
Desertification;**

**Building Science and  
Technology Policy  
Capacity;**

**Technological  
Innovation**

**Material  
Sciences,  
Manufacturing,  
Laser and Post  
Harvest  
Technologies;**

**Promoting the  
Creation of  
Technology Parks;**

**Information and  
Communication  
Technologies  
and Space.**

**Promoting Public  
Understanding of  
Science and  
Technology**

# Innovation – Africa's Top Priority

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- January 2007 Addis Ababa AU Summit: “Science and Technology and Innovation for Africa's Socio-Economic Development”
  - Programmes and Initiatives
    - African Science and Innovation Fund
    - 2007 – Year to build S&T&I Champions
    - Best Scientific Innovation in Africa Prize
    - “Regional Innovation Communities”
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# Efforts in South Africa

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## National Research and Development Strategy:

- *Achieving mastery of technological change in our economy and society (Innovation)*
  - *Increasing investment in South Africa's Science base (Human Capital and Transformation)*
  - *Strengthening the government S&T system (Alignment and Delivery)*
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# Indicators

## Quality of life

- Technology Achievement Index

## Wealth Creation

- Technology based growth

## SET Human Capital

- Researchers in workforce
- Demographics of SET workforce

## Technical progress (Improvement and Innovation)

- Patents
- Business R&D intensity
- ICT uptake indicators

## Business performance

- Technology/ trade mix
- Key sector performance
- New sectors (e.g. biotech)

## Future R&D capacity

- University enrolments
- S&T post-graduate degrees
- University Exemptions in Maths and Science

## Current R&D Capacity

- Share of publications
- R&D intensity (investment)

## Imported know-how

- Technology balance of payments

# South African Science and Technology Policy Landscape

**Economic Growth**  
**Poverty reduction**  
**Quality of Life**

**Vision  
2014**

**White Paper on  
Science and  
Technology**

**National  
R&D  
Strategy**

**Advanced  
Manufacturing  
Technology  
Strategy**

**Biotechnology  
Strategy**

**Information &  
Communications  
Technology  
Strategy**

**Poverty  
Reduction**

**Leveraging  
Resource  
Based  
Industries**

**Nanotechnology  
Strategy**

**Human Capital  
Development  
Strategy**

**Technology  
Transfer  
Strategy**

## Key Problem for R&D planners:

*“Britain does 5% of the world’s research and tries to maintain sufficient competence in the other 95% to be able to move into it if necessary.”*

- Sir William Stewart, former Chief Scientific Advisor to UK Government.

Africa does less than 1% of the world’s research. Clearly it will not be able to move into the other 99% as readily. How do you choose (and, indeed, should you?).

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# Some principles for choosing priority areas

- 1. Some areas are absolutely necessary for national competitiveness, for any size of country, e.g. information technology, biotechnology. Omit these at your peril!**
  - 2. Other areas present some “geographic” advantage, e.g. astronomy & “human origins” for Southern Africa.**
  - 3. Other areas present a “problem” advantage, e.g. HIV/AIDS vaccine for Africa.**
  - 4. Other areas present a “knowledge” advantage, e.g. traditional knowledge or deep level mining for South Africa.**
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# Criteria for choosing “core competence clusters”

1. A global competitive edge is possible – e.g. deep-level mining
  2. It is sustainable – e.g. does not depend just on a single research leader or funding window.
  3. Hard to emulate. E.g. fluorochemicals or radiopharmaceuticals on the platform of a nuclear industry
  4. Multiple applications are the norm, e.g. high performance computing, nanotechnology
  5. Should be able to attract international investment and collaboration, e.g. astronomy and vaccine development in Africa
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# Enabling Instruments for Innovation (South Africa)

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- Science parks – Gauteng Innovation Hub
  - Biotechnology Regional Innovation Centres
  - seda (Small Enterprise Development Agency) Technology Programme
    - Incubators
    - Technology Demonstration Centres
    - softstartBTI virtual incubators for ICT & Electronics
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# Enabling Innovation (2)

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- ❑ Technology Top 100 awards programme
  - ❑ Fiscal incentives for R&D
  - ❑ Industrial Development Corporation – competitive financing for sustainable development and innovation
  - ❑ Tshumisano technology stations at universities – technology solutions for SMEs
  - ❑ Develop robust and coherent intellectual property legislation – especially for public funded research
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# Innovation Fund

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- ❑ Invests in near market technological innovations
  - ❑ Establishment of commercially viable startup companies
  - ❑ Two types of funding:
    - Building on existing research and knowledge. Funding will lead to development of a prototype where a real or potential product or service has been identified
    - Funding that supports high risk market driven technologies in partnership with industry
    - Matches industry funds over a period of 5 years
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# Innovation Fund: Outcomes and Impact

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- ❑ Probability of economic outcomes from research increased
  - ❑ Jobs and firms created
  - ❑ Industry uptake of innovation enhanced
  - ❑ Patents secured
  - ❑ Collaborative research efforts entrenched
  - ❑ Culture of innovation stimulated at Universities
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# Innovation Fund Highlights

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- ❑ Mutation technology under-utilised indigenous flower crops
  - ❑ Effluent-free process to beneficiate magnesite resources
  - ❑ Production of thin film solar devices
  - ❑ Development of novel, injectable biomaterial from porcine bone for bone grafts
  - ❑ Technologies for zirconium applications: e.g. fuel cells, catalytic converters, etc.
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# Innovation Fund Highlights (2)

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- ❑ Wireless communications for rural communities
  - ❑ DNA technology for crops, e.g. maize, improvements
  - ❑ Mineral beneficiation – e.g. platinum jewellery
  - ❑ Interactive voice-enabled information systems for multilingual societies
  - ❑ Liquid vaccines against main pediatric diseases
  - ❑ Development of innovative new generation microsatellite cameras
  - ❑ New tool manufacturing technologies
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# Tshumisano Technology Stations

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- “Cooperation and Partnership”
- Technical support to existing SMEs:
  - Technology support, services and training
- Established at Universities of Technologies
  - Stations focused on R&D strength of University and areas of relevance local economy



# Tshumisano: Outcomes and Impact

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- ❑ Enriches hosting organisation's R&D portfolio
- ❑ Creation of employment opportunities
- ❑ Acquisition of technologies and knowledge for development projects
- ❑ Establishment of small business enterprises
- ❑ Project management skills for better business performance
- ❑ Improved production methods for increased income
- ❑ Direct intervention by targeting the most marginalised; women and the disabled
- ❑ Indigenous knowledge is transformed into products for sale



# Opportunities for Africa – European Innovation Partnership

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- ❑ Innovation Policy Dialogue
  - ❑ European development cooperation support – e.g. European Development Fund for innovation systems cooperation
  - ❑ Participation in EU Seventh Framework Programme
  - ❑ Participation in new EU Competitiveness and Innovation Framework Programme
  - ❑ Science and technology directed foreign investment in Africa – e.g. partnership with multinational companies, leveraging venture capital
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# Advancing African – European Innovation Partnerships

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- ❑ Raising awareness of cooperation opportunities (e.g. FP7) in BOTH Africa and Europe
  - ❑ African countries to invest in institutional mechanisms to support their participation in e.g. European collaboration
  - ❑ African and European countries to prioritise innovation as a focus area for their development cooperation partnerships
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# Thank You

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- ***European South African Science and Technology Advancement Programme***

- <http://www.esastap.org.za>

- ***Connecting Sub-Sahara Africa and Europe for ICT partnerships under FP7***

- <http://www.euroafrica-ict.org>

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