

# Regional integration and extractive industries: mining-related national systems of innovation in southern Africa

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# Outline

Part of larger research project on Regional Industrialisation supported by UNU-WIDER

- Rationale and research questions
- Key findings
- Implications for regional cooperation

# Rationale and Research questions

- Previous research on regional value chain for mining-related capital equipment:
  - SA dominant player but losing ground
  - Policy inconsistency across the region
  - Room for regional cooperation
- Resource-based industrialisation requires substantial domestic knowledge intensification efforts (de Ferranti et al. 2002; Blomström and Kokko 2007; Wright and Czelusta 2004, 2007)
- National System of Innovation (NSI) literature emphasizes the systemic and dynamic nature of innovation ecosystems (Freeman 1995; Viotti 2002; Lundvall 2010)

# Contd.

- The research covers the following aspects of NSI:
  1. Engineering consultancy services
  2. Engineering skills development
  3. (Technical Vocational Education and Training)
  4. R&D and Innovation
- Little research on mining-related NSIs in the region
- Mining-related NSIs in Botswana, Zambia and Zimbabwe different trajectories
- Cannot be seen in isolation otherwise we miss important regional dynamics related to skills development and competence building
- What is the role of South Africa?
- Policy implications

# Engineering Consultancy Services

- Regional value chain dominated by SA-based engineering firms, with significant regional skills – 2014, 14% foreign workers in the mining sector (South Africa Chamber of Mines)
- Except for South Africa, domestic markets are relatively open to foreign professionals
- Domestic firms relegated to lowest value added segments

## Challenges:

- Lack of enforcement of local content provisions
- Returning engineering skills struggle to enter the market
- Access to SA market is restricted

# Engineering Skills Development

- Significant engineering skills development for the region is taking place in SA
- Different trends in degree levels and return to home countries - Zambia biggest loser
- Institutional frameworks lag behind: 2000 SADC Regional Qualification Framework
- Weak cooperation: UB/UNZA with SU/UCT; UNZA-UZ – most relationships are informal
- SA qualification to circumvent limited recognition of regional qualifications

# R&D and Innovation

- SA leading capabilities in the region
- SA NSI not geared to the region yet market for innovation would be large
  - Council for Scientific and Industrial Research: lack of regional leadership (SIRDC/BITRI)
  - Mintek: No mandate although commercial interest
  - South African Minerals to Metals Research Institute (SAMMRI)
  - Wits Centre for Mechanised Mining Systems
  - Significant % regional researchers but no institutional linkages
  - Slow progress at SADC level but Botswana aim to regional reach

# A Regional System of Innovation?

Regional System of Innovation, including:

- cross-border investment flows
- flows of mining-related goods and services
- intra- SADC flows of students, lecturers, technicians, and engineers

**YET :**

- SADC institutional frameworks lag behind
- But bilateral cooperation also ineffective (SA leadership?)
- South Africa taps into the flows of regional skills to address its own skills deficit in engineering consultancy and R&D but very different dynamics
- Little impact on knowledge intensification outside SA

# Policy Implications

*‘regional cooperation can be driven by shared interests or by shared problems. In terms of cooperation driven by shared interests, there is a great potential for South Africa and Zambia to cooperate because of the long, shared history of the mining sector’*

*(Zambian high-level government official, Field interview)*

- SA leadership
- Cooperation across institutions (universities, TVET, associations, govt, firms)
- Revising the mandate of key SA R&D institutions to target the region
- Facilitating regional movement of engineering service providers
- Supporting linkages with domestic engineering firms in the region