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

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Outline

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• 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)
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