The role of science councils in realising national development goals

Balancing complex imperatives: evidence from research on five science councils

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PRESENTATION OUTLINE

1. Balancing shifting mandates: main challenges
2. Mapping patterns of interaction of individual scientists
3. Implications for policy and practice:
   • Organisational conditions that facilitate and constrain interaction
   • Policy conditions that facilitate and constrain interaction
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<tbody>
<tr>
<td>Traditional mandate</td>
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<td>Medical model: causes and treatment of disease</td>
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<td>Research and technological innovation to foster industrial, scientific development</td>
<td>Maximise the value derived from mineral resources</td>
<td>Survey for government and public</td>
<td>Commodity oriented: serve the needs of agriculture sector</td>
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<td>Main challenge to shift traditional mandate</td>
<td>Impact of R&amp;D and technology transfer</td>
<td>Expanded mandate: small-scale miners</td>
<td>Expanded mandate: geohazards</td>
<td>Expanded mandate: small farmers</td>
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<td>Impact of R&amp;D and technology transfer</td>
<td>Strengthen scientific reputation</td>
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Mapping patterns of interaction

• Extending scientific knowledge to the benefit of ALL external partners, through research, development and technology transfer, in line with unit and SC missions
• Insight into the ways SCs balance triple mandate and roles => to align activity more strategically
• What are the dominant, emergent and significant niche patterns of interaction of scientists in practice?
  • Main partners – firms, farmers, government, knowledge, civic, communities, welfare
  • Main types of relationship and channels of interaction
  • Main types of outcomes and benefits
## Scale of engagement

<table>
<thead>
<tr>
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<th>Population of scientists 2012/13</th>
<th>Sample of scientists</th>
<th>% scientists do not interact</th>
<th>Average number of partners</th>
<th>total of</th>
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<tbody>
<tr>
<td>SC5</td>
<td>451</td>
<td>283</td>
<td>21</td>
<td></td>
<td>9.2</td>
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<tr>
<td>SC4</td>
<td>501</td>
<td>383</td>
<td>17</td>
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<td>8.7</td>
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<tr>
<td>SC3</td>
<td>157</td>
<td>117</td>
<td>11</td>
<td></td>
<td>7.7</td>
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<tr>
<td>SC2</td>
<td>214</td>
<td>179</td>
<td>27</td>
<td></td>
<td>6.9</td>
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<tr>
<td>Average</td>
<td></td>
<td></td>
<td>19</td>
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<td>8.1</td>
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SC2: 3 clusters of partners with similar relationships
SC2 patterns of interaction

- Predominantly with firms, taking the forms of contracts, consultancy, needs assessments and technology transfer, for new or improved processes and products, but seen to enhance scientific reputations
- A significant scale of interaction with other knowledge users that tends to take more collaborative forms and leads to traditional academic outputs and reputations
- A niche of downstream, beneficiation-oriented R&D related to health applications of minerals
- An emergent niche addresses imperatives to support small scale miners and communities to promote livelihoods and economic development
- Evidence of a form of corporate social responsibility activities with communities - related largely to a role in education and skills development

=> reflects a balance of interaction aligned with strategic goals.
SC5 patterns of interaction

1. Public and community health oriented partners to design community-based interventions, leading to new and improved protocols, and cross-disciplinary knowledge production - a more socially engaged science

2. Knowledge generation and innovation-oriented partners: Main cluster of knowledge, government and funding partners; firms on a small scale - Formal traditional research relationships; applied research (consultancy and design and prototyping); joint commercialisation as very small cluster. Outcomes: primarily mandate of scientific excellence, also economic development and generalised contribution to public awareness and advocacy

• => imbalance and lack of alignment with strategic goals
Institutional conditions that facilitate and constrain interaction?

- Strategic mandate, historical trajectory and policy orientation: reputational and scientific concerns primary
- Conceptions of interaction and partnership
- External and internal interface structures:
  - Research office, contracts office, innovation office, strategic initiatives
  - Technology transfer office, incubator, research translation
- Interactive mechanisms:
  - Incentives (promotion, reward, awards)
  - Open days, websites, industry / community forums, publications/ newsletters
- Role of individual scientific leaders and “entrepreneurs”
- Functional integration and internal alignment
- INTERACTIVE CAPABILITIES?
Implications for policy and practice
What can science councils themselves do differently?

1. Strengthen alignment and coordination across units, to address strategic organisational mandates (internal interface mechanisms):
   • Matrix structure, strategic initiatives, high level manager, funding allocation processes

2. Prioritise and give authority to external interface structures and mechanisms:
   • MoUs, staff/student exchange, TTO, commercialisation/IP office, repositories, regional offices and sale of products, small business development unit, training and extension unit

3. Incentive mechanisms for individuals and units to promote their will to engage and align with strategic mandates:
   • KPAs, special awards, promotion criteria
Blockages, gaps and facilitators within NSI

• Value of reviews -> facilitate accountability and capacity building
• Coordination between line departments -> alignment of science council system
• The need for policy coherence and coordination -> avoid mission overload and risk to NSI
• The need to prioritise scientific excellence -> to link to global knowledge flows and national multi-disciplinary collaboration
• Exploiting IP a challenge -> apply policy in a more fine-grained manner
• Funding blockages -> consistency, 50% state funding for sustainability
New policy directions?

• Incentivising engaged science – promote a more effective balance of threefold mandate, around the core substantive role of science councils as knowledge actors
• A framework of innovation for inclusive development – to extend benefits of research and technology development in a more inclusive manner
• To prioritise developing capacity to interact with vulnerable and marginalised communities, and informal sector actors