Using Natural Resource Wealth to Improve Access to Water and Sanitation

David Doepel  Ryan Admiraal
Mark McHenry  Judy Walls

Africa Research Group
Murdoch University

Australian Government
Department of Foreign Affairs and Trade

Murdoch University
Mining in Africa

- In 2011, 5 of the top 20 fastest growing world economies (in terms of GDP) were in Sub-Saharan Africa with mining being a key contributor to this growth.\(^1\)

- Mining accounts for roughly 50% of GDP in Gabon and the Republic of Congo and approximately 40% of GDP in Botswana.\(^2\)

- The African continent ranks either first or second in deposits of a broad range of minerals, including bauxite, chromite, cobalt, diamond, manganese, phosphate rock, platinum-group metals, soda ash, and zirconium.\(^3\)

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\(^1\) International Monetary Fund, 2012.


Flip Sides of the Same Coin

**PRO**: Mining carries significant economic potential for developing nations in Sub-Saharan Africa.

**CON**: Mining introduces new pressures in cities and towns along mining corridors.
Pressures on Communities

- Resettlement
- Repurposing of land
- Population influx
  - Pressures on existing infrastructure, including water supply and both solid and human waste disposal.
  - Health impacts.
- Economic pressures on individuals
The Project

“Using Natural Resource Wealth to Improve Access to Water and Sanitation” aims to build the case for long-term investment of mineral resource revenues into the water and sanitation sector.

Considered in the context of mining corridors.

Improved access to and quality of water and sanitation has a variety of direct benefits for communities, but there are also co-benefits that are frequently overlooked.
Nacala Corridor, Mozambique
The towns of Ribaue, Mecuburi, Rapale, Namialo, and Monapo were all included in the Nampula Water, Sanitation and Hygiene (NAMWASH) Programme.

These towns all have growth rates above the Mozambican average and lie along the Nacala corridor.

Programme funded by the Australian Government and implemented by UNICEF Mozambique.

Included a baseline survey to establish water and sanitation conditions in these towns.
Nacala Corridor, Mozambique

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Water Source Usage

<table>
<thead>
<tr>
<th>Water Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard tap</td>
<td>0.1</td>
</tr>
<tr>
<td>Public tap</td>
<td>0.2</td>
</tr>
<tr>
<td>Borehole</td>
<td>0.3</td>
</tr>
<tr>
<td>Protected Well</td>
<td>0.4</td>
</tr>
<tr>
<td>Unprotected Well</td>
<td>0.5</td>
</tr>
<tr>
<td>Protected Spring</td>
<td>0.0</td>
</tr>
<tr>
<td>Unprotected Spring</td>
<td>0.0</td>
</tr>
<tr>
<td>River, Stream, Lake, Pond</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Commonly Used Water Sources

- Borehole
- Unprotected Well
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Latrine Type Usage

<table>
<thead>
<tr>
<th>Latrine Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running water system</td>
<td>0.2</td>
</tr>
<tr>
<td>Improved latrine (with manual water)</td>
<td>0.4</td>
</tr>
<tr>
<td>VIP latrine (with slab and vent pipe)</td>
<td>0.6</td>
</tr>
<tr>
<td>Improved latrine (with concrete slab)</td>
<td></td>
</tr>
<tr>
<td>Ecological latrine</td>
<td></td>
</tr>
<tr>
<td>Shared latrine</td>
<td></td>
</tr>
<tr>
<td>Traditional latrine (no slab or material not durable)</td>
<td>0.6</td>
</tr>
<tr>
<td>Open defecation</td>
<td></td>
</tr>
<tr>
<td>Cat system</td>
<td></td>
</tr>
</tbody>
</table>

Latrine Type
Anticipated Benefits of Improved Water Supply

Better water quality:

- Improved sources have significantly better water quality, both in terms of colony forming units (CFUs) and turbidity.

- This improvement in water quality does not necessarily carry over to the home (e.g. improper cleaning of water transport containers).

- Highlights that water interventions must be accompanied by sanitation and hygiene interventions.
## Anticipated Benefits of Improved Water Supply

### Increased water consumption:

<table>
<thead>
<tr>
<th>Water Source Type</th>
<th>Water Consumption (in litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard tap</td>
<td>25.88 (21.17, 30.59)</td>
</tr>
<tr>
<td>Public tap/standpipe</td>
<td>20.67 (17.14, 24.19)</td>
</tr>
<tr>
<td>Borehole</td>
<td>17.18 (16.23, 18.14)</td>
</tr>
<tr>
<td>Protected well</td>
<td>16.03 (13.25, 18.81)</td>
</tr>
<tr>
<td>Unprotected well</td>
<td>17.54 (16.75, 18.32)</td>
</tr>
<tr>
<td>Protected spring</td>
<td>7.33 (6.41, 8.26)</td>
</tr>
<tr>
<td>Unprotected spring</td>
<td>26.67</td>
</tr>
<tr>
<td>River, stream, lake, pond</td>
<td>23.69 (19.05, 28.34)</td>
</tr>
</tbody>
</table>

### Decreased time collecting water:

<table>
<thead>
<tr>
<th>Water Source Type</th>
<th>Time Collecting Water (in min/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piped</td>
<td>35.13 (26.53, 43.72)</td>
</tr>
<tr>
<td>Other improved</td>
<td>56.82 (53.08, 60.57)</td>
</tr>
<tr>
<td>Unimproved</td>
<td>56.03 (52.72, 59.34)</td>
</tr>
</tbody>
</table>
Anticipated Benefits of Improved Water Supply

Improved Health and Reduced Incidence of Childhood Death:

- Those living with HIV require increased quantity of water.\(^4\)
- Reduced incidence of water-borne diseases such as diarrhoea.
  - Second leading cause of death for children under the age of five in Africa.\(^5\)
  - Incidence estimated to be 8.45% for children under the age of five in these communities.

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\(^5\) Liu et al., 2010
Anticipated Benefits of Improved Sanitation

- Solid and human waste removal not considered to be a pressing issue for these towns, and household latrines were quite clean.

**Increased privacy and security, especially for women and girls:**

- Result of a reduction in the number of individuals using open defecation/cat method.
Increased School Attendance for Girls:

- Improvements could be made in schools, where, in spite of the overwhelming majority of latrines being improved:
  - only approximately 25% were judged to be clean,
  - only 10% had locks, and
  - none had sanitary bins in girls’ latrines.

- The odds of boys using schools latrine were approximately 2.5 times higher than that of girls.
Additional Benefits

**Increased business opportunities:**

- Increased spending on improved water supply and sanitation potentially creates new business opportunities.
  - Water infrastructure development/rehabilitation, latrine slab construction and selling, waste removal services, etc.

**Greater earning potential:**

- Time saved in getting water or finding a place to defecate can potentially be used for income-generating work.
Laying the Case for Investment in Water and Sanitation

- Both governments and industry strive to maximise return on investment.
- If water and sanitation improvements have already been made, this return on investment can be estimated through a cost-benefit analysis.
  - Incorporates the actual costs for the (ongoing) water and sanitation improvements and the amount that individuals are paying for these improvements.
- If improvements have yet to be made, a return on investment can be estimated through willingness to pay for the improvements.
- Focusing only on payments for water and sanitation services misses much of the value in water and sanitation improvements.
Laying the Case for Investment in Water and Sanitation

- It is vital that analyses additionally provide an economic measure of the values of:
  - improved health (through reduction in water-borne diseases),
  - reduced incidence of childhood death,
  - increased school attendance,
  - new job creation,
  - increased earning potential,
  - etc.

- Market values may be obtained for some benefits if enough time has elapsed from implementation of water and sanitation improvements. Otherwise, the contingent valuation method can be used to provide estimates.\(^6\)

\(^6\)Urama et al., 2006; Spash et al., 2006


(Accessed 1 April 2014.)
Sources II


