Developing an economic monitoring programme at the Lihir Gold Mine, Papua New Guinea

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Sources of impact

• The mine is owned and operated by Newcrest Mining Ltd (NML), one of the largest gold producers in the Asia Pacific region

• The mine currently produces over 700,000 ounces of gold per annum

• The mine employs nearly 2200 people (200 expatriates and 2000 PNG nationals, including 700 local Lihirians

• The mine commenced operations in 1995. Reserves expected to last 40 years.
Mine flows into the local economy

Close to half of the flows go to contracts with companies owned by traditional landowner.

There are over 700 registered landowner companies.

One of these companies (Anitua) is a multimillion dollar business.

In 2009 the mine delivered in excess of US$54 million in royalties, compensation and community development projects to Lihirian landowners.

<table>
<thead>
<tr>
<th>NIMAMAR RURAL LEVEL LOCAL GOVT</th>
<th>Proportion TTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalties</td>
<td>3.49</td>
</tr>
<tr>
<td>Other (NDA Grants)</td>
<td>0.16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTRACTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Landowner Contracts</td>
<td>47.14</td>
</tr>
<tr>
<td>Landowner J/V Contracts</td>
<td>24.66</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIRECT LIHIRIAN PAYMENTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalties (Block Holders)</td>
<td>2.29</td>
</tr>
<tr>
<td>Royalty Others</td>
<td>0.01</td>
</tr>
<tr>
<td>Economic Plant Compensation</td>
<td>0.86</td>
</tr>
<tr>
<td>Noise, Light &amp; Dust</td>
<td>0.11</td>
</tr>
<tr>
<td>Lihirian Meals</td>
<td>0.24</td>
</tr>
<tr>
<td>Land Use Rental</td>
<td>0.46</td>
</tr>
<tr>
<td>Community Assistance &amp; Donations</td>
<td>1.92</td>
</tr>
<tr>
<td>IBP Commitments</td>
<td>3.90</td>
</tr>
<tr>
<td>Lihirian Salary &amp; Wages</td>
<td>8.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GRANTS (LMALA)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.65</td>
<td></td>
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</tbody>
</table>

| LAMALA Crib Meals              |                |
| 0.01                           |                |

| VDS                            |                |
| Relocation of Villages         | 0.57           |
| VDS Housing                    | 1.44           |
| VDS Grants                     | 0.66           |
| Capital Projects               | 3.44           |
Newcrest flows to Lihirian economy

Contracts Percentage of Total Flows

- Total Flows in PGK
- Contracts total

Contracts percentage of total flows

- 1997: 44%
- 1998: 72%
- 1999: 63%
- 2000: 60%
- 2001: 56%
- 2002: 66%
- 2003: 71%
- 2004: 75%
- 2005: 78%
- 2006: 80%
- 2007: 77%
- 2008: 69%
- 2009: 65%
Mining impacts on local economies in PNG

- Transition from subsistence work to wage labour;
- New types of inequality;
- Migration and resettlement
- Change in land use
- New forms of economic dependency upon the resource developer;
- New opportunities are created for economic activities that were previously difficult;
- Greater economic diversity;

- Will these impacts ultimately improve Lihirians livelihoods?
- Is everyone improving equitably?
- What are the costs of improvement?
From ED to HD

Papua New Guinea
- GDP per capita: $2,395
- Population: 6.8 million
- HDI rank: 137

Bolivia
- GDP per capita: $4,502
- Population: 10 million
- HDI rank: 95
The human development perspective

This framework of analysis is a way of understanding, indentifying and organising the relationship between the sources of impacts and indicators of development in Lihir.
Existing literature on local mining economies in PNG

Qualitative Studies

- Quantitative studies based on local economy surrounding a mine site
- Local level economy

Qualitative mine site anthropological studies

Quantitative Studies

- National level mining industry studies
- National economy

Qualitative studies on the informal economy.

National level economy

- Existing literature on local mining economies in PNG

Bains (1999)
Parsons & Vincent (1991)
Togolo (2004)

Koyama (2005)

Bosworth and Anderson (2000)
Connell (2007)
Lahiri-Dutt and Macintyre (2006)

Bainton (2010)
Ballard and Banks (2003)
Filer (1999)
Kirsch (2006)

Banks (1999)
LGL (2009)
Missens (2006)
NWT Department of Industry, Tourism and Investment (2011)
Similarities:

• Agreement is made between 3 parties: government, company and traditional land owners.

• The socio-economic agreements (SEA) are follow up programs not ad-hoc.

• The socio-economic monitoring program is embedded in the SEA.

• The program monitors progress on health, education and economic development.
Cohen’s 4 Models of Socioeconomic Impact Monitoring

- Global Standards: GRI, Global Compact
- Managing Supply Chains: ILO
- Assessing Integration into the local economy: Anglo American SEAT toolbox
- Contributing to social and economic development: Unilever, P & G, Vodafone, Heineken.
Lihir Social Impact Monitoring highlights since early exploration

First Social Impact Assessment (SIA) carried out in early exploration stage. Provides baseline

Second SIA starts to monitor changes in employment patterns

Third SIA carried out one year after mine opens. SIA conforms to agreement

The Assessment and Impact Monitoring (AIM) section starts operating as an independent unit alongside Community Relations, Sustainable Development and Resettlement

The Lihir Economic Study commences.

The study includes a baseline of local economic activity including that of Small and Medium Enterprises.

A Household survey is currently under way.

Annual socioeconomic reporting starts

## Current indicators of the Lihir monitoring framework

<table>
<thead>
<tr>
<th>Population</th>
<th>Law and Order</th>
<th>Education</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude birth rate per 1000</td>
<td>Number of crimes reported per 1000 persons</td>
<td>Primary completion rate, total (% of relevant age group)</td>
<td>Hospital beds (per 1,000 people)</td>
</tr>
<tr>
<td>Crude death rate per 1000</td>
<td>Number of crimes against persons reported</td>
<td>Literacy rate, adult total (% of people ages 15 and above)</td>
<td>Contraceptive prevalence rate (% of women ages 15-49), any method</td>
</tr>
<tr>
<td>Sex ratio at birth</td>
<td>Number of crimes against property reported</td>
<td>Ratio of literate females to males, 15-24 year olds</td>
<td>Prevalence of HIV, total (% of population ages 15-49)</td>
</tr>
<tr>
<td>Total fertility rate</td>
<td>Number of crimes without victims reported</td>
<td>School enrolment ratio, primary (% gross)</td>
<td>Prevalence of HIV, female (% of population ages 15-24)</td>
</tr>
<tr>
<td>Maternal mortality rate</td>
<td>Number of other crimes reported</td>
<td>School enrolment ratio, secondary (% gross)</td>
<td>Tuberculosis death rate (per 100,000 people)</td>
</tr>
<tr>
<td>Neonatal mortality rate per 1,000 live births</td>
<td>Alcohol and drug related crimes</td>
<td>Number of teachers, primary</td>
<td>Tuberculosis treatment success rate (% of registered cases)</td>
</tr>
<tr>
<td>Infant mortality rate per 1,000 live births</td>
<td>Migrant related crimes</td>
<td>Number of teachers, secondary</td>
<td>DOTS detection rate (% of estimated cases)</td>
</tr>
<tr>
<td>Child mortality rate (1-4 years)</td>
<td>Crime rate</td>
<td>Ratio of girls to boys in primary and secondary education (%)</td>
<td>Disease prevalence / infection rates: Malaria, ARI, Diarrhoea, Measles, TB, HIV, Filariasis, Dengue</td>
</tr>
<tr>
<td>Life Expectancy at Birth</td>
<td>Percentage of known crimes dealt with by informal mechanism</td>
<td>Student teacher ratio, primary</td>
<td>Accident / injuries (ie. road trauma)</td>
</tr>
<tr>
<td>Median age of total population</td>
<td>Percentage of known crimes dealt with by formal mechanism</td>
<td>Student teacher ratio, secondary</td>
<td>Tuberculosis incidence (per 100,000 people)</td>
</tr>
</tbody>
</table>
Most monitoring activities are currently carried out by the Social Impact Monitoring (SIM) section.

SIM currently employs 11 core staff

A network of 35 Village Information Officers (VIOs).

The partnership with the CSRM, established in 2007, provides additional research support for the monitoring program.
- Employment in sectors other than mining
- Household consumption and expenditure patterns
- Household savings and debt
- Inflation rates
- Poverty rates
- Income inequality

- Number and type of economic activity other than mining (including the informal sector)
- Non-paid work (child care and house work)
- Communal and Ceremonial activities
- SME wellbeing

Indicators of the New Economic Monitoring Framework
Thank you
Muchas Gracias