Artisanal Mining and Sustainable Development

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www.acetforafrica.org
Artisanal and Small-Scale Mining (ASM) in Africa

9 million ASM operators and about 54 million people whose livelihoods depend on the sector

ASM employs 10 times more miners than the large scale mining sector

18% of Africa’s gold, and almost all gemstones except diamonds, are produced by ASM

<table>
<thead>
<tr>
<th>Period</th>
<th>ASM operators</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>1,998,350</td>
<td>24</td>
</tr>
<tr>
<td>2011</td>
<td>8,210,000</td>
<td>23</td>
</tr>
<tr>
<td>2014</td>
<td>9,878,500</td>
<td>40</td>
</tr>
</tbody>
</table>

ASM is gaining more prominence as a source of livelihood
## Differences:

<table>
<thead>
<tr>
<th>Endogenous Factors</th>
<th>Artisanal Mining</th>
<th>Small-Scale Mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Individual local entrepreneurs, family/community</td>
<td>Upsurge in foreign ownership</td>
</tr>
<tr>
<td>Land</td>
<td>Requires relatively small land size</td>
<td>Larger land size required</td>
</tr>
<tr>
<td></td>
<td>- Surface mining - highly itinerant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Underground - less itinerant. Could last for decades</td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td>Intensive, largely met by locals</td>
<td>Less Intensive, some labor substituted with capital, involvement of non-indigines</td>
</tr>
<tr>
<td></td>
<td>- Young work force, 18-35 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Predominantly male, women mainly involved in panning (gold) and crushing ore (diamonds)</td>
<td></td>
</tr>
<tr>
<td>Equipment/Technology</td>
<td>Basic tools: pick-axe, shovel, wood, hammer</td>
<td>More sophisticated equipment: excavators, earth moving equipment, dredgers, tractors, processing plants</td>
</tr>
<tr>
<td>Capital</td>
<td>Low capital input, particularly on local and family-owned operations</td>
<td>Increasingly capital intensive, external ownership (particularly foreign ownership) is growing</td>
</tr>
<tr>
<td>Water</td>
<td>Heavily reliant on water. Mainly surface water; rivers and streams</td>
<td>Water intensive</td>
</tr>
</tbody>
</table>

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**ACET**

African Center for Economic Transformation  
[www.acetforafrica.org](http://www.acetforafrica.org)
<table>
<thead>
<tr>
<th>Country</th>
<th>ASM Artisans</th>
<th>Dependents</th>
<th>Dependents (% of Pop)</th>
<th>Mineral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eritrea</td>
<td>400,000</td>
<td>2,400,000</td>
<td>53.64</td>
<td>Gold</td>
</tr>
<tr>
<td>CAR</td>
<td>400,000</td>
<td>2,400,000</td>
<td>52.23</td>
<td>Diamonds, Gold</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>300,000</td>
<td>1,800,000</td>
<td>24.34</td>
<td>Diamonds, Gold</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>500,000</td>
<td>3,000,000</td>
<td>18.58</td>
<td>Diamonds, Gold, Colored Gemstones</td>
</tr>
<tr>
<td>Tanzania</td>
<td>1,500,000</td>
<td>9,000,000</td>
<td>16.20</td>
<td>Gold</td>
</tr>
<tr>
<td>Ghana</td>
<td>1,100,000</td>
<td>4,400,000</td>
<td>15.60</td>
<td>Diamonds, Gold, Sand</td>
</tr>
<tr>
<td>Mali</td>
<td>400,000</td>
<td>2,400,000</td>
<td>13.34</td>
<td>Gold</td>
</tr>
<tr>
<td>Niger</td>
<td>450,000</td>
<td>2,700,000</td>
<td>13.06</td>
<td>Gold</td>
</tr>
<tr>
<td>Liberia</td>
<td>100,000</td>
<td>600,000</td>
<td>13.00</td>
<td>Diamonds, Gold</td>
</tr>
<tr>
<td>Guinea</td>
<td>300,000</td>
<td>1,500,000</td>
<td>12.10</td>
<td>Diamonds, Gold</td>
</tr>
<tr>
<td>Madagascar</td>
<td>500,000</td>
<td>2,500,000</td>
<td>10.04</td>
<td>Gold, Colored Gemstones</td>
</tr>
<tr>
<td>South Sudan</td>
<td>200,000</td>
<td>1,200,000</td>
<td>9.81</td>
<td>Gold</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>200,000</td>
<td>1,000,000</td>
<td>5.36</td>
<td>Gold</td>
</tr>
<tr>
<td>Mozambique</td>
<td>100,000</td>
<td>1,200,000</td>
<td>4.16</td>
<td>Gold, Colored Gemstones</td>
</tr>
<tr>
<td>Country</td>
<td>Development Partner</td>
<td>Focus Areas</td>
<td></td>
<td></td>
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<tr>
<td>-----------------</td>
<td>--------------------------------------------------------------------------------------</td>
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</tr>
</tbody>
</table>
| Ethiopia        | • Canadian International Resources and Development Institute (CIRDI)  
                 • World Bank and IFC                                                                                                                 | • Resource governance and support the long-term management of a sustainable mining sector  
                                                                                                                                         • Disclosures along the ASM gold-buying value chain  
                                                                                                                                         • Health and sanitation, diversification of incomes within ASM |
| Kenya, Rwanda, Uganda | Department for International Development (DFID)                                     | Document the economic contributions of ASM in East Africa, study and map value chains                                                        |
| Tanzania        | • Gemological Institute of America (GIA)  
                 • USAID                                                                            | • New field tool to deliver a range of gemological information, increase the job skills and the market knowledge of ASM  
                                                                                                                                         • Child health and reduction in child mining in northern Tanzania |
| Nigeria         | Australian Government                                                                | Zamfara state - Mercury reduction, chemical-free processing for gold                                                                        |
| DRC             | • Trafigura Corporation  
                 • WEF’s Global Battery Alliance                                                      | Social conditions and technical mining standards in cobalt and copper                                                                        |
| Andean countries| Swiss Agency for Development and Cooperation (SDC)                                    | Regulation of ASM and its environmental impact                                                                                               |
Transformative Area of Focus: ASM/Agriculture Nexus

**Government Regulators**

- Mining
- Environmental Protection
- Agriculture

**Rural Mining Community**

- ASM Operators: Diamonds, Gold
- Determinants: Land, Labor, Water, Capital
- Smallholder Farmers: Cash crops, Food crops

**Outcomes**

**Positive**
- Increased employment income
- Increased farm productivity
- Increased economic activity

**Negative**
- Destruction of farmlands
- Pollution of waterways
- Public health problems
- Reduction in arable land
- Reduction in agricultural productivity
- Decline in output and food security

Rural Mining Communities Development Outcomes
ASM/Agriculture: Ethiopia

- Artisan composition: 65% men and 35% women
- 43.2% of miners also involved in subsistence farming
- Mining contributes about 10% of Ethiopia’s foreign exchange earnings. 65% of this mining is artisanal
- Employment of at least 1.26 million people and supports the livelihood of over 7.5 million
- Minerals: Gold, Gemstones, Tantalite, Salt, Sandstone, and Limestone

Development Partnerships

- JSDF Capital Project: Grant from Japanese Social Development Trust Fund to reduce poverty levels of artisan miners and increase share of women miners
- Other development partners working with the government to; Conduct geological mapping and demarcate land for mining, Provide extension services, Lay down basic infrastructure and improved mining technological facilities, Strengthen legal market system
ASM/Agriculture: Ghana, S. Leone, B. Faso

Artisanal mining the second largest employer after smallholder agriculture

Ghana:
- 1 million miners with over 4 million dependents. 1/3 of gold output is from ASM
- 45% of active labor force employed in the agriculture sector

Sierra Leone:
- ASM responsible for 80%-90% of total gold and diamond output
- 2/3 of population engaged in agriculture

Burkina Faso:
- Gold the second largest export after cotton, doubling since 2008 driven by ASM
- More than 90% of economically active population engaged in agriculture

Some development partners e.g. Ford Foundation and GIZ mainly fund research on ASM in these countries while others such as IMPACT directly engage the communities.
Ford Foundation/ACET Case Study Findings

**Land ownership** – Defines whether relationship is transactional/ competitive or complementary:

- Farmer-Miner arrangement used in Sierra Leone harmonizes the two activities
- Conflictual Relationship seen in Ghana and Burkina Faso worsened by dominance of non-indigenes in ASM

**Land use** - Intensity of land use and the itinerant nature of ASM a major source of conflict

**Labor and Capital** - Heavy reliance on manual (unskilled) labor in both sectors and the higher wages available in ASM undermine the complementarity of the two activities

**Environmental and social impact** - Diversion of streams and conversion into mine sites, contamination by mineral processing, lowering the groundwater table through dewatering of mine pits, hazardous abandoned sites close to communities - breeding grounds for mosquitoes, residual mercury and cyanide

**Impact on women and youth** - Indirect burden of ASM activities more severe on women who are expected to also play a vital role in smallholder agriculture. Children carting ores on their heads across the sites for panning. Detriment to education and health
USAID Case Study Findings

USAID in collaboration with The Government of Ghana conducted a study in Western, Eastern and Ashanti regions.

Findings:

- Loss of fertility of farmlands leading to low yields compounded by dwindling farm size
- Yields of all staples reduced by 45%, increased dependence on imported foods at higher prices
- Increased cases of malaria, respiratory and skin diseases
- Illicit drugs due to the labor intensive nature of ASM
- High school drop out rates with 10% literacy rate among young miners
- Little to no impact from governmental institutions and environmental agencies present
- Educational campaigns, fines and imprisonment hitherto ineffective
Is ASM Sustainable?

Non-renewable nature of the commodity

- limited geoscientific information – leads to itinerancy
- Itinerancy, even if regulated, ultimately leads to damage to and displacement of farmlands, threatening food security and earnings

Changing structure of the ASM industry

Shift from pick-axes and shovels to heavy-duty earth moving and dredging machines

- Job-creation potential limited due to capital-labor substitution
- Earnings from the sector financing investments and consumption in the national and regional capitals and only a little trickle down to the communities
Recommendations for Sustainable and Economic Transformation

- **Strengthen institutional capacity** to plug the loopholes in regulatory responses
  - Land use - Need for comprehensive geological mapping and land use plan, identifying areas of mineral reserve potentials and guiding the utilization of land resources for other purposes
  - Restricting the use of heavy earth-moving and dredging equipment in artisanal mining sites. This requires a clear distinction between artisanal mining and small-scale mining

- **Strict enforcement of the already well-articulated policies** and regulations
  Challenges:
  - Regulatory capture
  - Weak institutional capacity
  - Weak coordination

- **Address the longstanding challenges confronting smallholder agriculture**
  Such as financing, logistics, and technical support