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# The Impact of Expanding Artisanal and Small-Scale Mining on Small Holder Agriculture in West Africa

A Case Study of Burkina Faso, Ghana and Sierra Leone

**SYNTHESIS REPORT OCTOBER 2017**



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# EXTRACTIVES

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# CONTENTS

## Table of Contents

<b>Abbreviations and Acronyms .....</b>	<b>4</b>
<b>Acknowledgements.....</b>	<b>5</b>
<b>Executive Summary .....</b>	<b>7</b>
<b>Chapter 1: Introduction .....</b>	<b>12</b>
1.1 Background.....	12
1.2 Context of Study.....	12
1.3 Previous Studies.....	13
1.4 Study Objectives .....	14
1.5 Conceptual Framework.....	14
1.6 Methodology .....	14
<b>Chapter 2: Situation Analysis In Study Countries.....</b>	<b>18</b>
2.1 Socio-Economic Background.....	18
2.2 Role of Agriculture and Mining in the Study Countries .....	18
2.3 Key Features of Artisanal and Small-Scale Mining (ASM) and Smallholder Agriculture in the Study Countries.....	21
<b>Chapter 3: Policy and Regulatory Environment.....</b>	<b>22</b>
3.1 Sector Policies.....	22
3.2 Sector Legislation and Regulations.....	23
<b>Chapter 4: Research Findings.....</b>	<b>26</b>
4.1 Introduction .....	26
4.2 Relationship between ASM Activities and Smallholder Agriculture .....	26
4.3 Impact of ASM Activities on Smallholder Agriculture.....	28
4.4. Policy and Regulatory Gaps.....	31

# Table of Contents

<b>Chapter 5: Summary, Concluding Observations and Policy Recommendations.....</b>	<b>33</b>
5.1 Summary.....	30
5.2 Concluding Observations .....	31
5.3 Policy Recommendations.....	32
<b>ANNEXES .....</b>	<b>34</b>
<b>FOOTNOTES.....</b>	<b>34</b>
<b>REFERENCES .....</b>	<b>34</b>

## List of Tables

<b>Table 1:</b> Key Socio-Economic Indicators of Study Countries, 2016 .....	<b>19</b>
<b>Table 2:</b> Key Agriculture-Related Indicators of Study Countries .....	<b>20</b>
<b>Table 3:</b> Key ASM-Related Indicators in the Study Countries.....	<b>20</b>
<b>Table 4:</b> Key Features of Artisanal Mining and Smallholder Agriculture .....	<b>21</b>
<b>Table 5:</b> Key Laws and Regulations that Govern Mining Activities.....	<b>25</b>
<b>Table 6:</b> Land Destroyed by ASM.....	<b>29</b>

## List of Figures

<b>Figure 1:</b> ASM/Smallholder Agriculture Relationship Mix .....	<b>15</b>
<b>Figure 2:</b> Annual Real GDP Growth Rates in Study Countries and SSA (%).....	<b>19</b>
<b>Figure 3:</b> Farms Lost to ASM in Last Three Years .....	<b>29</b>
<b>Figure 4:</b> Images of High Concentration of Labor and Use of Simple Tools in Ghana .....	<b>38</b>
<b>Figure 5:</b> Images of Increasing Use of Heavy-Duty Machines at Some ASM Sites in Ghana .....	<b>39</b>
<b>Figure 6:</b> Artificial Lakes Created in the Aftermath of ASM Activities in Sierra Leone.....	<b>39</b>
<b>Figure 7:</b> Women Gold Miners in Mathunkara, Tonkolili District, in Sierra Leone .....	<b>39</b>



SYNTHESIS  
CONTENTS

# Abbreviations and Acronyms

**ADMS** Alluvial Diamond Mining Scheme

**AGRA** Alliance for a Green Revolution in Africa

**AMV** Africa Mining Vision

**ASM** Artisanal and Small-Scale Mining

**AU** African Union

**CAADP** Comprehensive Africa Agriculture  
Development Programme

**ECOWAS** Economic Community of  
West African States

**EITI** Extractive Industry Transparency Initiative

**EMDP** ECOWAS Minerals Development Policy

**EPA** Environmental Protection Agency

**FASDEP** Food and Agriculture Sector  
Development Policy

**GDP** Gross Domestic Product

**GGDO** Government Gold and Diamond Office

**GPRS** Growth and Poverty Reduction Strategy

**GSGDA** Ghana Shared Growth and  
Development Agenda

**MDAs** Ministries, Departments, and Agencies

**MDGs** Millennium Development Goals

**METASIP** Medium-Term Agriculture Sector  
Investment Plan

**MMMR** Ministry of Mines and Mineral Resources

**NSADP** National Sustainable Agricultural  
Development Plan

**PNDCL** Provisional National Defence Council Law

**PNDES** National Plan for Economic and  
Social Development

**PRSP** Poverty Reduction Strategy Paper

**SDGs** Sustainable Development Goals

**SCP** Smallholder Commercialization Program

**SSA** Sub-Saharan Africa

**SSM** Small-Scale Mining

**SSMP** Small-Scale Mining Project

**TCP** Tree Crops Policy

**UNECA** United Nations Economic Commission  
for Africa

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**Inclusive economic growth  
is high on the development  
agenda of sub-Saharan  
African countries**



# Executive Summary

**Inclusive economic growth is high on the development agenda of sub-Saharan African countries. Choices are limited and countries are looking to engage and nurture any potential sources of livelihood that may emerge to expand job creation, reduce poverty and to consolidate their progress towards economic transformation. After focusing on large-scale mining for years, many African countries<sup>1</sup> are now considering mainstreaming artisanal and small-scale mining (ASM) as a catalyst for inclusive growth. ASM has been touted as having the potential to improve rural livelihoods<sup>2</sup>, with greater distributional benefits to mining communities than those derived from large-scale mining.<sup>3</sup> However, the destructive nature of ASM activities on the environment is raising considerable concern regarding the negative impact on agriculture and the sustainability of mineral-rich rural communities.**

**A**t the 2015 Mining Indaba, held in Cape Town, South Africa, the Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development observed that ASM “is one of the most intractable, multi-faceted, and complicated challenges facing mineral development the world over”. Popularly known as *galamsey* in Ghana, *orpaillage* in Burkina Faso, and “*diggers*” in Sierra Leone, artisanal is a “labor-intensive mineral extraction and processing activity”<sup>4</sup> that has been expanding steadily over the past two and a half decades. It is growing in significance in resource-rich rural communities.

If the full potential of ASM activities in sub-Saharan Africa is to be realized, then there needs to be a better understanding of the forms and extent of the threat that ASM poses to agriculture in order to establish a solid basis for policy and regulatory reforms that integrate ASM into local economic transformation. The threats are emerging rapidly, but the efforts to develop a deeper understanding of the sector are lagging considerably behind.

This study therefore attempts to add to existing knowledge on the intricate and dynamic relationship between two key sources of rural livelihood. It explores whether the practices and activities of ASM can sustainably provide livelihoods complementary to those in smallholder agriculture in communities where both are widespread. Thus, the spotlight is primarily on ASM (and not on smallholder agriculture) because of the serious threat that unregulated artisanal mining poses to agriculture and food security in affected communities.

Three countries were selected for in-depth review: Burkina Faso, Ghana and Sierra Leone. Although there are definite advantages to studying more countries, this study focused on these three countries because of the intense relationship between ASM and farming activities in these countries. Gold and diamonds, two of the most globally sought-after precious commodities, are the primary activities engaged in by ASM operators in these three countries: Gold in Ghana and Burkina Faso, and diamonds (and to some extent gold) in Sierra Leone.

Funded by a research grant from the Ford Foundation, the study draws on a desk review and extensive field work through a survey of and interviews with artisanal and small-scale miners, smallholder farmers, community leaders, policy makers and other stakeholders within the mining and agriculture value chain. The outcomes of all these are contained in country reports that form the basis for this synthesis report.

## Sectoral Overview

Agriculture and mining make varying contributions to economic output in the three study countries. As with most African countries, smallholder agriculture dominates in the three study countries, constituting over 80% of the total agriculture sector workforce. It is organized largely as a family enterprise, and all major agronomic activities such as weeding, sowing and harvesting are undertaken largely by family labor. The tools are rudimentary – hoe and cutlass – and require a youthful labor force. But as the youth is moving into artisanal and small-scale mining or to the urban areas



to seek employment, the sector is increasingly home to an aging workforce. The lower productivity that characterizes the sector has been associated with the aging workforce, and inadequate agrochemical and other inputs. Low remuneration of contracted labor has also been noted as a key factor, as it discourages the labor force, especially the youth, from taking to farming as a vocation.

After smallholder agriculture, artisanal and small-scale mining is the second highest employer, in resource-rich rural communities in the selected study countries. It is estimated that over 1 million people are engaged in ASM in Ghana, with over 4 million dependents. In Burkina Faso and Sierra Leone, the size of the ASM workforce is smaller, but still significant in terms of national population. Artisanal mining makes a significant contribution to national mineral output in all three study countries. In Ghana, ASM contributes nearly a third of national gold output. Given that until recently most ASM activities were locally financed and most of the inputs are obtained locally, such a sizeable contribution to national output highlights the level of financial resources that are injected into rural communities where ASM activities take place. In Sierra Leone, the ASM sector makes a significant contribution to diamond and gold exports, and therefore government revenues. In 2014, artisanal mining contributed 36% and 64% of diamond and kimberlite mineral exports respectively. The situation is similar in Burkina Faso, where there are growing numbers of people involved in ASM activities in the gold sector. Gold production in Burkina Faso has doubled since 2008 and gold has become the second largest export product after cotton.

## Summary of Findings

Drawing on the field work conducted in the three study countries, the study attempts to answer the following questions:

- What are the effects of ASM activities on smallholder food- and cash-crop farming in selected communities endowed with minerals in the three study countries?
- What are the effects of ASM activities on women and young adults in areas where ASM is dominant and where women play a significant role in agriculture?
- Which of the two rural development drivers (ASM or smallholder agriculture) is likely to be a more sustainable tool of poverty reduction in affected communities?

- What are the public policy responses to the emerging labor and land-use conflicts, and the water resource constraints facing agriculture as a result of ASM activities? What are the regulatory gaps?
- What can the government and other stakeholders do to ensure that the two economic activities can coexist to boost livelihoods and improve development outcomes?

The study reviews the underlying determinants of the relation as defined in the conceptual framework (land ownership, land use, labor and capital), as well as the environmental and social impact, and in particular impact on women and youth.

**Land ownership.** The structure of land ownership is perhaps the single most important factor defining the relationship between ASM and smallholder farmers. It defines whether the relationship will be transactional/ competitive or complementary. In Sierra Leone, the “farmer-miner”<sup>5</sup> arrangement fosters a harmonious relationship between the two activities, while in Ghana and Burkina Faso, the dominance of non-indigenes in ASM operations has led to transactional and often conflictual relationships with the dominant land owners – the smallholder farmers.

**Land use.** The intensity of land use and the itinerant nature of ASM are shown in the study to be key determinants of the relationship with smallholder farmers. In Burkina Faso and Ghana, there is a strong transactional and competitive relationship between the two sources of rural livelihood. The study notes several instances of conflict between ASM operators and farming communities in Burkina Faso and Ghana. But even in Sierra Leone where less tension was observed (due to the farmer-miner structure of the two operations), there was evidence of fierce competition between artisanal miners and smallholder farmers for swamp lands, which contain fertile soil that is both suitable for farming and has good potential for mineral exploitation. From the interviews, some stakeholders state that swamp lands should be ring-fenced for rice and vegetable cultivation. So far, policies and legislation have failed to address these emerging land use issues in all three countries.

**Labor and Capital.** The heavy reliance on manual (unskilled) labor in both sectors and the higher wages available in ASM, undermines the complementarity of the two sources of rural livelihood in resource-rich communities in the study countries. So far, Sierra Leone has been spared this insidious dynamic due



to the “farmer-miner” structure of the operations and the adherence to the off-season regulation<sup>6</sup>. However, with increasing use of heavy earth-moving and dredging equipment in artisanal mining, the distinction between artisanal miners and small-scale miners is becoming blurred, particularly in Ghana and Burkina Faso. In Sierra Leone, the intensity of capital infusion is still low, due to stricter adherence to the regulations as well as the continuing dominance of the farmer-miner occupational structure.

**Environmental and social impact.** Perhaps the single most important reason why ASM may be incompatible with smallholder agriculture is its huge negative environmental and social footprint. In this study, evidence captured in photographs and video clips clearly portray some of the negative impact, which includes diversion of streams and their conversion into mine sites; contamination caused by mineral processing; and lowering of the groundwater table occasioned by dewatering of mine pits. Also observed are widespread abandoned sites close to communities, which are breeding grounds for mosquitoes and containing high levels of residual chemicals such as mercury and cyanide, which constitute major health hazards for the communities.

The study countries have environmental management agencies that play a substantial role in regulating mining activities. However, most of ASM operates outside the remit of the law and is therefore not properly regulated by these agencies. Local governments in the three countries also exercise some responsibility for ensuring that all economic activities undertaken in their jurisdiction meet some environmental sustainability standards; yet, enforcement is weak.

**Impact on women and youth.** Women are increasingly involved in hazardous ASM activities. Across the study countries, it is common to find very young boys and girls engaging in all manner of activities, with girls in particular carting ore on their heads from one part of a mining site to another, to be panned for gold. In survey sites in Ghana, some of the women were found with their children at the sites, endangering not only their education and careers but also their lives, given the harmful conditions in which they work. Since most of these same women play very important roles in smallholder agriculture, the consequential effects on agriculture can be significant. In addition to these direct effects, the study also shows that in all three countries, the indirect burden of ASM activities is even more severe on women; these include the rising cost of foodstuffs and other household needs and the drudgery of

walking longer distances to fetch water and firewood, as most of the nearby streams are either dried up or contaminated and forest areas laid bare by clearing of wide expanses of land for ASM activities.

## Concluding Observations

**Effects of ASM on smallholder agriculture and women and young adults.** Survey data demonstrate the overwhelmingly negative impact of ASM activities on smallholder agriculture. These are summarized below:

- a. The growing imbalance in the power relations between the itinerant ASM entrepreneurs and workers on the one hand and sedentary smallholder farmers on the other.
- b. The growing overvaluation of assets in resource-rich rural communities that is increasing the vulnerability of rural households and undermining efforts to reduce poverty.
- c. The growing threat to food security, the reduction in available arable land and consequent reduction in food- and cash-crop production.
- d. The environmental and health risks associated with unregulated ASM activities.
- e. The negative impact on women and young adults.

**Can ASM be a sustainable tool for poverty reduction in resource-rich communities?** The preponderance of the evidence from this study suggests that this is highly unlikely, due to two factors. First is the non-renewable nature of the commodity and thus the itinerant nature of the sector; second is the changing structure of the ASM industry.

The non-renewable nature of the commodity, including the limited geoscientific information, inherently defines the itinerant nature of the sector. Shifting from one location to another every two to three years, even if regulated, will ultimately lead to damage to and displacement of farmlands, threatening both food security and external earnings. As the commodity is non-renewable, it cannot be a sustainable medium- or long-term source of income for the communities. The study shows several communities virtually becoming ghost towns and devastated farmlands featuring huge, mosquito-infested and chemically polluted pools, as well as dried-up streams.

The changing structure of ownership of factor inputs (from pick-axes and shovels to heavy-duty earth moving and dredging machines), and in particular increasing capital flows from external sources, implies two outcomes:

- a. Job-creation potential would be limited due to capital-labor substitution. The notion that artisanal mining is a safety valve for the demographic bulge was perhaps valid five years ago and only for the short-term due to the factors mentioned above.
- b. Most of the earnings from the sector are financing investments and consumption in the national and regional capitals and only a little trickle down to the communities. Thus, in terms of being an agent of poverty reduction, the evidence for ASM is not compelling from this study, at least in the Ghana case. And in Sierra Leone and Burkina Faso, where the downside risks are moderate, the evidence from the study suggest a growing convergence with the Ghanaian experience.

Effectiveness of policy and regulatory responses to the challenges confronting the ASM sector. Governance arrangements are reasonably good in all three countries, but the regulatory responses are weak. Unlike Ghana, where regulatory provisions for artisanal mining are not distinct from small-scale mining, Burkina Faso and Sierra Leone are very explicit in the requirements for artisanal mining. This deficiency in the Ghana small-scale mining code needs examining. However, the main challenges in policy and regulatory responses involve compliance and enforcement. Licensing is very weak in all three countries, but much worse in Ghana where less than of third of ASM operators have operating permits. In addition to mining without permits, the lack of compliance and weak enforcement of environmental and health requirements are a major concern in all three study countries.

## Policy Recommendations

*What can be done by the authorities and other stakeholders to ensure that ASM can coexist sustainably with smallholder agriculture to improve development outcomes in mineral-rich rural communities?*

Evidence from this study suggests that there are policy and regulatory responses which, if effectively implemented, would mitigate to some extent the negative effects outlined earlier. However, it must also be recognized that for the two sources of rural livelihood to coexist sustainably, it would take strong and determined political leadership to contain the huge and inherent downside risks of ASM. Unfortunately, the headwinds are blowing in the direction of continuing tensions and conflicts.

The study offers three keys to mitigating the negative impact of ASM on the livelihoods of rural communities, two of which are addressed in this report: (a) strengthening institutional capacity to plug the loopholes in regulatory responses; and (b) strict enforcement of the already well-articulated policies and regulations. The third key – addressing the longstanding challenges confronting smallholder agriculture (such as low productivity and inadequate financial, logistical and technical support) – is not the focus of this study. It is a major topic in itself and has been a subject of many studies, including a recent report by ACET.<sup>7</sup>

**Filling the gaps in regulatory response.** The regulatory landscape for ASM needs to be improved in all three study countries, with policies and laws updated and aligned with current trends in ASM activities. Current laws in the study countries perceive ASM as a century-old, pick-axe-and-shovel activity. Two specific areas merit consideration:

- **Land use:** The lack of an effective regulatory response to land use is partly responsible for the indiscriminate incursions into cash-crop farmlands by ASM operators. None of the countries under study has a comprehensive geological mapping and land use plan, identifying areas of mineral reserve potentials and guiding the utilization of land resources for other purposes. This is key to the mutual coexistence of the two sectors and the promotion of sustainable growth and development of the rural communities. Already the ASM sector is wreaking significant damage on agricultural lands and the only way to reverse that sad trend is through rigorous land use management interventions, and proper demarcation of areas for cash and food crops and those reserved for ASM activities.
- **Capital-labor substitution effects:** The question is, will this fast-growing trend in ASM undermine the job-creation potential that the sector is being touted to provide? The study shows that about one million persons are directly engaged in ASM in Ghana, 300,000 in Sierra Leone and about 200,000 in Burkina Faso. If ASM is seen as a major pathway to rural job creation and thus improvement in the livelihood of mineral-rich communities, then this emerging trend can be regarded as a manifestation of market failure, requiring state intervention. For example, the regulations will have to focus on restricting the use of heavy earth-moving and dredging equipment in artisanal mining sites. In this regard, Ghana has to learn from both Sierra Leone and Burkina Faso, which have a clear regulatory distinction between artisanal mining and small-scale mining.
- However, would such a market intervention be a viable regulatory response? Would it sustainably reduce poverty in these communities? The study shows that such regulations will be extremely difficult to enforce and unlikely to achieve intended outcomes in the study countries and particularly in Ghana where regulatory capture seems evident. More traction could be gained by focusing on enforcing existing regulations than introducing new ones. Thus, effective regulatory responses would be to support artisanal miners (the workers) with resources and training to engage in their trade effectively, and strict enforcement of licensing.

#### **Strict enforcement of policies and regulations:**

Enforcement has been a challenge due to three factors (a) regulatory capture; (b) weak institutional capacity; and (c) weak coordination. Overcoming regulatory capture requires the political will to dismantle the patronage structures that prevent effective implementation of rules and regulations. In Ghana, the change is beginning to occur with the moratorium on ASM in order to address the root causes. Adequate resources for training, monitoring and enforcement would also be required. The current institutional arrangements that empower regional and district leadership structures need to be strengthened along with coordination among key stakeholders. In particular, the capacity of the Environmental Protection Agency (EPA) needs to be built up at regional and district levels.





# CHAPTER 1

## Introduction

### 1.1 Background

Inclusive economic growth is high on the development agenda of sub-Saharan African countries. Choices are limited and countries are looking to nurture any potential sources of livelihood that may expand job creation, reduce poverty and consolidate their progress towards economic transformation. After focusing on large-scale mining for years, many African countries<sup>8</sup> are now considering artisanal and small-scale mining (ASM) as a catalyst for inclusive growth. ASM has been touted as having the potential to boost rural livelihoods<sup>9</sup>, with greater distributional benefits to mining communities than currently derived from large-scale mining.<sup>10</sup> However, the destructive impact of ASM activities on the environment, on agriculture and the sustainability of rural communities is raising considerable concern.

At the 2015 Mining Indaba in Cape Town, South Africa the Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development observed that ASM “is one of the most intractable, multi-faceted, and complicated challenges facing mineral development the world over”. Popularly known as *galamsey* in Ghana, *orpaillage* in Burkina Faso, or “diggers” in Sierra Leone, ASM is a “labor-intensive mineral extraction and processing activity”<sup>11</sup> that has been expanding steadily over the past two and a half decades. It is growing in significance in resource-rich rural communities.

If the full potential of ASM activities in sub-Saharan Africa is to be realized, then there needs to be a better understanding of the forms and extent of the threat that ASM poses to agriculture in order to establish a solid basis for policy and regulatory reforms that integrate ASM into local economic transformation. The threats are emerging rapidly, but the efforts to develop a deeper understanding of the sector are lagging considerably behind.

The present study was commissioned to: (i) investigate the current relationship between ASM activities and smallholder agriculture in Ghana, Sierra Leone, and Burkina Faso; (ii) determine whether the two activities can sustainably provide complementary livelihoods in communities where ASM activities are widespread; and (iii) explore the resource-use (land and water) management policies and regulations

that can create opportunities for mining without an adverse long-term impact on smallholder farming. Funded by a research grant from the Ford Foundation, the study draws on a desk review and extensive field work through a survey of and interviews with artisanal and small-scale miners, smallholder farmers, community leaders, policy makers and other stakeholders within the mining and agriculture value chain. The outcomes of all these are contained in country reports that became the basis for this synthesis report.

### 1.2 Context of Study

It is estimated that about 9 million people are directly engaged in ASM across 45 countries in Africa.<sup>12</sup> At sub-regional level, estimates of ASM in West Africa give a conservative figure of 2.4 million, with Nigeria constituting 21%, while Liberia, Guinea, and Côte d'Ivoire contribute a combined total of 12.5% (Hayes 2008). In Ghana, the sector's contribution to national gold production has increased steadily from less than 5% of total gold output in 1990 to about 14% in 2004, and subsequently to about 34% in 2012, according to the Minerals Commission of Ghana. ASM gold output in Burkina Faso was estimated to have reached between 5,000 kg and 10,000 kg in 2012 while large-scale gold production decreased by 12.4% in 2012. In Sierra Leone, much of ASM activities are in diamonds and, to a lesser extent, gold, and directly employ 200,000 to 300,000 miners and diggers, who are responsible for the about 80%-90% of total diamond and gold output in the country.

Meanwhile, smallholder agriculture has long been described as the backbone of many West African countries as it provides significant amounts of produce (both cash and food crops), jobs and incomes, and is the main source of livelihood for rural folk. According to the Ghana Statistical Service (2014), about 44.3% of Ghana's active labor force is employed in the agricultural sector. In rural areas, the proportion of the active labor force engaged in agricultural activities is much higher (74.2%). In Burkina Faso, more than 90% of the economically active population is engaged in agricultural activities, with area under cultivation continually expanding each year.<sup>13</sup> In Sierra Leone, about two-thirds of the population is engaged in agriculture.

Despite the significance of these two activities in the economy of these countries, the boom in mineral commodity prices as compared to agroforestry commodity prices since the 2000s has turned ASM into a relatively “high-value” activity. ASM activities have exploded in many parts of the developing world over the last two decades, in some cases encroaching on farmland, threatening other agricultural land, destroying forest reserves and polluting waterways. Farm labor shortages are becoming a reality in communities where ASM activities are widespread. For example, the old practice of sharecropping contractual arrangements in cash-crop farming is becoming relatively more expensive and less attractive as ASM pays more for unskilled labor, leading to a rapid exodus of labor into mining. With rising labor costs and slow and low returns in smallholder agriculture, some farmers are ceding agricultural land to small-scale miners, even if it means losing access to farmlands for years to come. Thus, the economic gains from increased ASM output are not without cost. There are implications for food production and food security, with potential nationwide macroeconomic effects through food price inflation. In the long term, this could have adverse implications for a country’s scale of exports of cash crops and efforts to eradicate hunger.

This study is particularly important because of the serious threat that unregulated artisanal mining poses to agriculture and food security. There is a growing need to understand the interaction and challenges between what has been characterized in the past as two potentially complementary rural poverty-reducing activities. There is a growing realization that their relative roles may not necessarily be complementary. Unlike large-scale mining that operates within a concession of land area, the threat of ASM to agriculture lies in its itinerant nature, moving from one location to another, in many cases without backfilling and reclaiming land previously used for farming, and without restoring waterways and interrupted streams, leaving land unfit for farming for years to come. In Ghana, for example, in and around the Obuasi gold mining district, orange farms which produced the famous “Obuasi Orange” because of its natural sweetness, are no longer a thriving smallholder business because of the fear that the oranges may have absorbed mercury and other compounds including cyanide. Decades of underground and surface mining and environmental pollution are likely to have contributed as much to this damage, only made worse in recent years by the unregulated and itinerant ASM activities that have exploded in the area.

### 1.3 Previous studies

Results of studies on the relationship between ASM activities and smallholder agriculture have been inconsistent and divergent. In Ghana, Yeboah (2014), reported that farmers are being lured away from agriculture which they have “long lived with”, as ASM activities provide substantially greater earnings. Ontoyin and Agyeman (2014) concluded that ASM activities in the Talensi-Nabdam District of Ghana reduced the amount of agriculture and related activities such as fishing, shea-nut picking, and fire wood collection. Increased ASM activities were also seen to have resulted in the “death of livestock, theft of animals, unproductive farm lands and reduction of labor for farming activities” (Ontoyin and Agyeman, 2014). In Burkina Faso, Gueye (2001) argued that many of the ASM operators are “those who have abandoned farming activities and taken up mining in the hope of getting rich quickly”. However, Hilson et al., (2014); Awumbilla and Tsikata (2010) for Ghana; Cote (2013) for Burkina Faso; and Cartier and Bürge (2011) for Sierra Leone have posited a complementarity relationship between the two activities. According to Cote (2013), since the 1980s, rural farmers in Burkina Faso have increasingly turned to ASM activities as “a complement to existing livelihood activities”.

However, a deeper understanding of the dynamics between ASM and smallholder agriculture is needed. There is limited information on the nature and incidence of resource-use conflict between ASM and agriculture, and no comparative or regional studies have been undertaken to benchmark good practices to inform policies and regulations. Prevailing opinion has not been based on robust, all-encompassing stakeholder consultation. It has been based on perceptions, anecdotes, and limited field-gathered data. Critical to this conversation is the sustainability dimension of ASM and smallholder agriculture and which policies can ensure mutual coexistence of the two activities. The literature is also deficient on the kinds of land use management policies and regulations that can create opportunities for mining without having severe long-term impact on smallholder farming. This study aims to bridge this and other identifiable gaps in the growing literature.

The study presents case studies of Burkina Faso, Ghana and Sierra Leone, with the goal of contributing much needed evidence on the extent and the incidence of ASM-agriculture problems, and to provide lessons and recommendations that can form the basis of a dialogue as the first step in seeking solutions.

## 1.4 Study Objectives

The overarching objective of the study is to assess the relationship between ASM activities and smallholder agriculture in Ghana, Sierra Leone and Burkina Faso with a view to determining whether the two practices can sustainably provide complementary livelihoods in rural communities where ASM activities are widespread. A complementary objective is to explore the resource-use (land and water) management policies and regulations that can create opportunities for ASM without adverse long-term impact on smallholder farming.

The specific objectives of the study are to:

- Examine the scope of the policy and regulatory environment of ASM in Ghana, Sierra Leone and Burkina Faso;
- Examine the effects of ASM activities on smallholder food- and cash-crop farming in selected communities endowed with minerals in the three study countries;
- Assess the effects of ASM activities on women and young adults in areas where ASM is dominant and where the role of women in agriculture is paramount;
- Determine which of the two rural development drivers (ASM or smallholder agriculture) is likely to provide a more sustainable tool for poverty reduction in affected communities;
- Assess the response of public policy to the emerging labor issues, land-use conflicts and water resource constraints facing agriculture as a result of ASM activities;
- Determine the gap between policy and regulatory intentions and what actually happens on the ground, and draw practical lessons;
- Explore what the government and other stakeholders can do to ensure that the two activities coexist to boost livelihoods and improve development outcomes.

## 1.5 Conceptual Framework

**Figure 1** outlines the conceptual framework for the study. The authorizing environment consists of the state institutions that define policies and regulate the two sectors. These are the ministries, departments and agencies (MDAs) responsible for mining and agriculture. A third agency, the Environmental Protection Agency (EPA) that straddles the two sectors ensures policy and regulatory coherence

for the protection of the environment. The EPA is key in mitigating the downside impact of ASM and contributing to the coexistence of the two primary sources of livelihood in the communities. Below the public-sector agencies are the two actors: artisanal and small-scale miners on one hand, and smallholder farmers on the other. The ASM operators mainly extract gold and diamonds while smallholder farmers are engaged in food- and cash-crop production.

The framework recognizes the intricate and dynamic relationship between these two sources of rural livelihood. They are intricate because they occupy the same geographic space and share and/or compete for the same factor inputs: land, labor, water and capital. These are considered the proximate determinants of the relationship. They are dynamic, because they are influenced by other exogenous factors or determinants: commodity prices, weather, and the finite, non-renewable nature of ASM. The model refers to smallholder agriculture only to the extent that it is affected by ASM; the emphasis is on ASM and its positive and negative impacts as defined below:

**Positive intermediate and ultimate development outcomes include:** job creation, increased income (supplementing the income of farmers who branch into mining, allowing them to improve the productivity of their farms through inputs such as fertilizers and labor); increased disposable income to finance household expenditures; generating demand for off-farm economic activities in production and services, better community facilities, etc.

**Negative intermediate and ultimate development outcomes include:** destruction of farmlands, pollution of waterways, public health problems, reduction in arable land, reduction in agricultural productivity, decline in output and food security, decline in export earnings from cash crops and likely decline in employment.

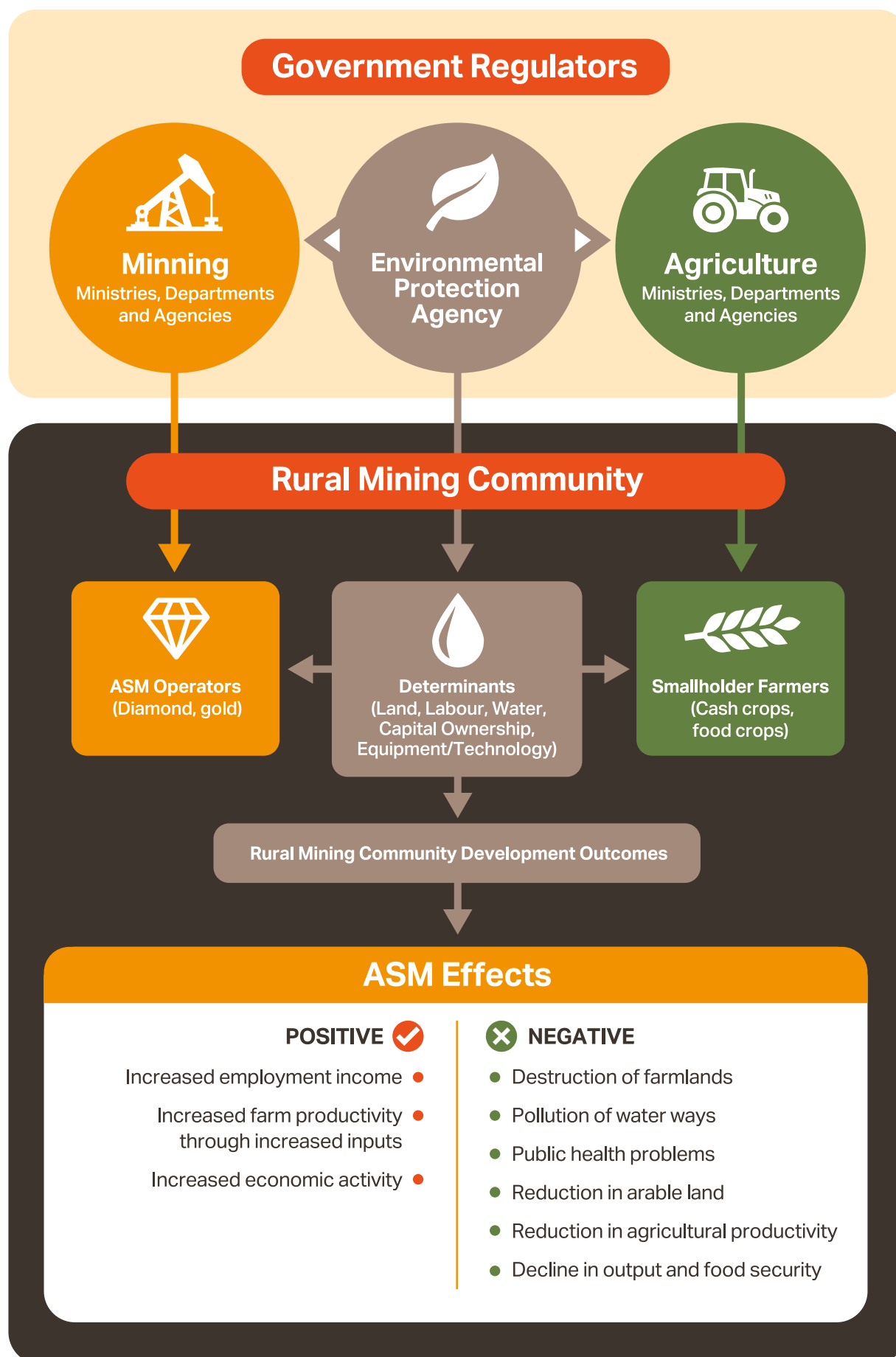
To achieve these positive intermediate and ultimate development outcomes, policy and regulatory interventions must address the proximate and exogenous determinants of the relationships outlined above. Such interventions will benefit from in-depth, evidence-based analysis focusing on these key determinants both at local and national levels as this study attempts to do.

## 1.6 Methodology

**Country Selection:** This synthesis report draws on the findings and recommendations of three country studies: Burkina Faso, Ghana and Sierra Leone. Although there are definite advantages of studying



Figure 1: Conceptual Framework—ASM/Smallholder Agriculture Nexus



more countries, this study focused on Burkina Faso, Ghana and Sierra Leone because of the intense nature of the relationship between ASM and farming activities in these countries. In the West Africa region, it is in these countries that the interaction between ASM and smallholder agriculture is coming under greater scrutiny and, therefore, demand is growing for a clear public policy response. Gold and diamonds, two of the most globally sought-after precious commodities are the primary attractions for ASM operators in these three countries: gold in Ghana and Burkina Faso, and diamonds (and to some extent gold) in Sierra Leone.

The study was conducted in three phases: Phase 1 involved all activities leading to and including the inception meeting. Phase 2 covered the actual country studies and delivery of the final country reports. Phase 3 covered the preparation of the synthesis report based on country studies and the outreach/dissemination plan. **Annex 1** provides a detailed description of these phases.

Each country study consisted of two parts: primary and secondary data collection. The primary data collection instruments included questionnaires, one-on-one interviews, focus group discussions, and direct field observation. The secondary data collection consisted mainly of literature review (articles and studies undertaken by various scholars), including a review of government policies and regulations. The sample population for the primary data collection effort comprised ASM operators, smallholder farmers, community leaders, government officials and other community groups, civil society organizations (CSOs) and non-governmental organizations (NGOs). The selected farming and mining communities are described below:

In **Burkina Faso**, the five communities covered were:

- a. Diarkadogou (Bougouriba Province). The mining community has a population of about 10,000, including miners from all parts of the country as well as from other West African countries.
- b. Kien/Diosso site (Houet Province), has a population of about 76,570 (2006 Census); mainly famers and gold miners. The mining site has a population of 2,000 people.
- c. Loto (Bougouriba Province). This is a small community with a population of about 665 inhabitants, with a preponderance of males (60%). The main economic activity of the population is agriculture and livestock rearing. Artisanal mining started in 2009 by non-natives, because the activity is prohibited by the mayor, given the traditional belief that gold money is evil. Gold is a spiritual being among the indigenes of this community, therefore gold mining is forbidden and money derived from gold cannot be used for any useful thing. On the other hand, the non-indigenes (particularly the Mossi), do not have this belief and predominate in artisanal mining in this community.
- d. Alga site (Bam Province). This site has been exploited for the past 30 years. It is not a farming community. In a population of between 4,000 and 5,000 artisanal miners, 70% are non-natives.
- e. Ronguenn site (Bam Province). This a spontaneous site that belongs to one owner, who is also the sole buyer of gold. Civil society organizations and key government agencies engaged in mining and agriculture issues were also canvassed for qualitative data.

In **Ghana**, three districts selected for in-depth survey were:

- a. In the *Upper East Region*, the Nangodi township in the Nabdram District, and Datoko in the Talensi District were selected. Mining in these two towns has a relatively long history – a German company operated a goldmine in the 1940s in Nangodi and there has been artisanal and small-scale mining activity there ever since. Russian miners also explored the entire Talensi-Nabdram mining belt in the 1930s (Hilson, 2001). Information from the Minerals Commission indicates that more than 10 ASM operators have been issued small-scale mining licenses to operate in the district, but they constitute only a small fraction of mining operations there. Notwithstanding the growth of ASM in these two districts, traditional smallholder agriculture continues to dominate their economic activities.
- b. In the Western Region, Tarkwa-Simpa is the fourth largest community in the Tarkwa-Nsuaem Municipality, with a population of less than 4,000. Agriculture is the dominant activity of the community, employing about a third of the labor force. It is the first place where mining activities started in Ghana prior to the arrival of Europeans. After agriculture, artisanal and small-scale mining is the next major economic activity of the community.
- c. In the Western Region, the Wassa Ehyireso community in the Prestea-Huni Valley District is the third area of study. The main livelihood of 45% of the indigenes is farming. In addition to the presence of ASM, the district also has some of the largest mining companies in the country: AngloGold Ashanti, Golden Star Resources, Aboso Goldfields, Prestea Sankofa Gold and New Century Mines.

In **Sierra Leone**, the areas include: Nimikoro and Nimiyama Chiefdoms in Kono District and Tane and Kunike Barina Chiefdoms in Tonkolili District.

- a. *Kono District* is a diamond-rich district located in the Eastern Region of Sierra Leone. It has 14 Chiefdoms, of which two: Nimikoro and Nimiyama, were selected for the study. The Kono district is the largest diamond producer in Sierra Leone; other important economic activities include gold mining and agricultural production (rice, coffee and cocoa). Artisanal mining has been the main occupation of the local people since commercial quantities of diamonds were discovered in the 1930.
- b. *Tonkolili District* in the Northern Region has significant potential in the extractive sector, specifically iron ore, bauxite, gold and also diamonds. The district has the biggest iron ore deposit in Africa and the third largest in the world.

The information collected was complemented by a thorough literature review on the policy and regulatory framework of ASM and agriculture, and current practices in each country to provide background material to be complemented by the field work.

Implementation of this project began in May 2016, with funding from the Ford Foundation. The project included the research and publication of three country case studies on the impact of expanding artisanal and small-scale mining (ASM) and small holder agriculture in Ghana, Sierra Leone and Burkina Faso, three country-level validation workshops and a synthesis report. The main research and field work were conducted over a period of six months (from June 2016 to December 2016), while the country validation workshops spanned a period of three months (February 2017 to April 2017).





# CHAPTER 2

## Situation Analysis of Study Countries

### 2.1 Socio-economic background

The economic growth experience in the three study countries since the early 2000s has been good overall, with average performance better than the average for sub-Saharan Africa over the period (**Figure 1**). While Sierra Leone experienced negative growth rates in 2001 and 2015 (due to the civil war), Ghana and Burkina Faso have recorded consistently positive growth rates over the last two decades, with average GDP growth ranging from 5.5% for Burkina Faso and 6.1% for Ghana to 6.2% for Sierra Leone (**Table 1**).

Unfortunately, the steady growth rates achieved over the past two decades have not translated into growth in decent jobs, raising concerns about the quality of growth among various stakeholders. This has led to advocacy for focused and more inclusive economic growth paths, such as labor-intensive smallholder agriculture and ASM activities. This concern of jobless growth (as well as the widening gap between rich and poor) was expressed in the 2013 Africa Progress Panel Report which focused on Equity in Extractives (Africa Progress Panel, 2013). The employment situation in the region, therefore, continues to worsen, particularly for the rising youth population.

Of the three countries, Ghana, as a lower middle-income country, is the most advanced and diversified (**Table 1**). GDP per capita in Ghana (US\$1,513.50) is twice that of Sierra Leone (US\$796), and nearly three times that of Burkina Faso (US\$650). Industry value added is highest in Ghana at 28.2% of GDP, followed by Burkina Faso (22.2%) while the lowest is Sierra Leone at 6% of GDP. Sierra Leone is the least diversified, with over 60% of its economy dependent on agriculture. Social indicators, measured by life expectancy and the Human Development Index, mirror the relative differences in economic indicators, with Ghana performing above the SSA average and much better than Burkina Faso and Sierra Leone (**Table 1**).

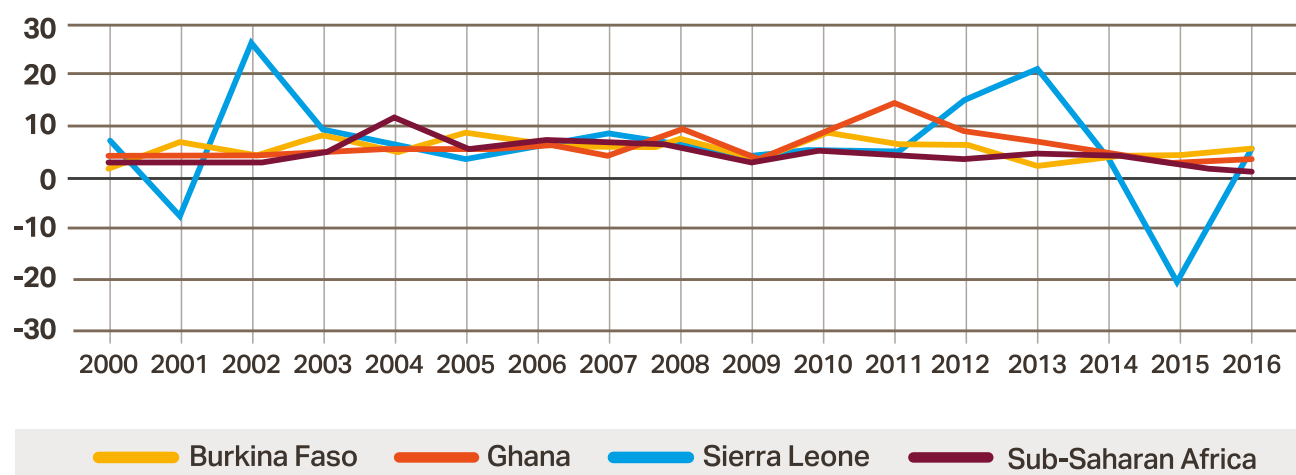
### 2.2 Role of Agriculture and Mining

Agriculture and mining make varying contributions to economic output in the three study countries. When combined, the two sectors employ the highest proportion of the labor force in Burkina (80%), Sierra Leone (75%) and Ghana (42%).

**Agriculture.** In Ghana, the agricultural sector contributes a fifth of GDP while in Burkina Faso and Sierra Leone, the sector contributes a third and two-thirds of GDP respectively (**Table 2**). Between one-half and two-thirds of the labor force in the study countries are engaged in the agricultural sector. In Ghana, 44.3% of currently employed people work in the agricultural sector<sup>14</sup>. In Burkina Faso, available statistics suggest that about 78.4% of its labor force is employed in the agricultural sector while in Sierra Leone the proportion engaged in agriculture stands at 68.5% (**Table 2**).

The importance of the sector can also be viewed in relation to merchandise exports and, therefore, foreign earnings. In Ghana, the agricultural sector contributes almost a third (32%) to merchandise exports and, therefore, foreign exchange earnings. The contributions in Burkina Faso and Sierra Leone are greater: 44% and 88% of merchandise exports respectively (**Table 2**).

**Smallholder agriculture:** As with most African countries, smallholders dominate the agricultural sector in the three study countries, constituting over 80% of the total agriculture sector workforce. Smallholder agriculture is organized largely as a family enterprise, and all major agronomic activities such as weeding, sowing and harvesting are undertaken largely by family labor. The tools are rudimentary – hoe and cutlass – and require a youthful labor force. But as the youth population is moving into artisanal and small-scale mining or to urban areas to seek employment, the sector is increasingly populated by an aging workforce. The lower productivity that characterizes the sector has been associated with the aging workforce, and inadequate agrochemical and other inputs. Low remuneration of contracted labor has also been noted as a key factor as it discourages the labor force, especially the youth, from taking on farming as a vocation.

**Figure 2: Annual Real GDP Growth Rates in Study Countries and SSA (%)**


**SOURCE:** World Bank, World Development Indicators 2016

**Table 1: Key Socio-Economic Indicators, 2016**

Indicators	Burkina Faso	Ghana	Sierra Leone	SSA
Population (in thousands)	18,646.43	28,206.73	7,396.19	1,033,300
Population Growth (%)	2.9	2.2	2.2	2.7
Labor Force (% of population)	45.6	47.2	38.7	n/a
GDP (current US\$ million)	12,115.16	42,68978	3,668.88	
Real GDP growth (%)	5.9	3.6	6.1	1.2
Real GDP growth (%) [2000-2016 average]	5.5	6.1	6.2	4.8
GDP per capita (current US\$)	649.7	1,513.5	496.0	1,450
GDP per capita growth (annual %)	2.8	1.3	3.8	-1.5
Agriculture, value added (% of GDP)	32.6	19.6	61.4	17.9
Industry, value added (% of GDP)	22.2	28.2	5.9	23.7
Services, value added (% of GDP)	45.2	52.2	32.7	58.3
Extractives, value added (% of GDP) EITI*	9.35	8.45	2.6	n/a
Merchandise Trade (% of GDP)	46.0	57.7	59.8	38.7
Ease of Doing Business World Ranking	146	108	148	143
Life Expectancy at Birth (2015)	59	61	51	58.9
Human Development Index	0.402	0.579	0.420	0.523

\*Data were obtained from 2013 Extractive Industry Transparency Initiative (EITI) reports. The extractives sector includes mining, oil and gas. Burkina Faso and Sierra Leone are not producing oil and gas but Ghana is.

**SOURCE:** World Bank Development Indicators Database

**Table 2: Key Agriculture-Related Indicators**

Indicators	Burkina Faso	Ghana	Sierra Leone	SSA
Agricultural land (% of land area)	44.2	69.0	54.71	42.14
Agric. labor force (% of total employment)	78.42	44.3	68.46	n/a
Food exports (% of merchandise exports)	44.02	32.05	87.81	10.65
Food imports (% of merchandise imports)	13.96	16.80	20.72	12.04

**Table 3: Key ASM-Related Indicators**

Indicators	Burkina Faso	Ghana	Sierra Leone
Population (thousands)	18,646.43	28,206.73	7,396.19
Number of people in ASM Activities*	200,000	1,100,000	300,000
Number of dependents of ASM workers*	1,000,000	4,400,000	1,800,000

\*The data are from the "Minerals and Africa's Development: International Study Group Report on Africa's Minerals Regime".

**Mining:** At less than 10% of GDP (**Table 1**), the contribution of the mining sector to the economies of the three countries is lower than that of agriculture. However, in terms of earnings (foreign exchange earnings and domestic tax revenue), the mining sector's contribution is not negligible. In Ghana, the sector contributes between 15% and 20% of domestic tax revenue and about a third of foreign exchange earnings (Boas & Associates, 2015). In Sierra Leone, the mining industry until recently was the biggest revenue earner, accounting for 80% of revenue and 90% of exports. The industry currently employs over 300,000 people, most of whom are in the artisanal mining sector. In Burkina Faso, the mining sector plays an important role in the economy, contributing almost 20% of value added to GDP.

**Artisanal and Small-Scale Mining:** By far, ASM is the second highest employer, after smallholder agriculture, in resource-rich rural communities in the selected study countries. It is estimated that over 1 million people are engaged in ASM in Ghana, with over 4 million dependents. In Burkina Faso and Sierra Leone, the absolute number of the workforce is smaller, but when compared to the national population, they are quite significant (**Table 3**). In many rural communities where ASM activities are intense, there are very few non-farming and non-mining activities.

Artisanal mining makes a significant contribution to national mineral output in all three study countries. In Ghana, ASM contributes nearly a third to national gold output. Given that until recently, most ASM activities were locally financed and most of the inputs were obtained locally, such a significant contribution highlights the level of financial resources that are injected into rural communities where ASM activities take place.

In Sierra Leone, the ASM sector makes a significant contribution to diamond and gold exports, and therefore government revenues. In 2014, artisanal mining contributed 36% and 64% of diamond and kimberlite mineral exports respectively. A similar trend can be observed in Burkina Faso, where there are growing numbers of people involved in ASM in the gold sector. Gold production in Burkina Faso has doubled since 2008 and has become the second largest export product after cotton.



## 2.3 Key Features of ASM and Smallholder Agriculture

Derived from the conceptual framework, **Table 4** below presents a taxonomy of the key proximate determinants of the relationship between the two main sources of livelihood in resource-rich rural communities.

**Table 4: Key Features of Artisanal and Small-scale Mining and Smallholder Agriculture**

Endogenous factors	Artisanal Mining	Smallholder Agriculture
<b>Ownership</b>	Mainly individual entrepreneurs. But in Sierra Leone, it is largely a family-based enterprise, with ownership entirely by people in the community. Mixed in Ghana and Burkina Faso; most areas dominated by non-indigenes, even from outside the region. In a few areas, some indigenes work and own ASM operations.	Predominantly family practice and owned by indigenes of the communities. In relatively few cases, where land is relatively scarce, families move to other areas to establish their farms.
<b>Land</b>	Artisanal mining requires relatively small piece of land (varies by country); Surface mining requires more land and is very itinerant and intensive, moving elsewhere once ore depletes. Underground type, less itinerant, often lasts several years, a decade or more  Small-scale mining requires much larger (also varies by country)	Requires relatively small piece of land (5-10 acres in Sierra Leone). Sedentary – same piece of land is used over and over again. In some cases, may be left to fallow for a year or two, but never abandoned.
<b>Labor</b>	Intensive, largely met by local or external: Sierra Leone, predominantly local family labor; in Burkina Faso and Ghana predominantly non-indigenes. Young workforce (18-35). Predominantly male, but women are involved particularly in panning (gold) and crushing diamond ore.	Labor intensity is seasonal, mainly local and family, but external labor requirements increase during harvesting. Aging population – 55 years plus. Women dominant in food crops and men in cash crops.
<b>Equipment/Technology</b>	Artisanal – basic tools: pick-axe, shovel, wood, hammer, etc.  Small scale – more sophisticated equipment: excavators, earth moving equipment, dredgers, tractors, processing plants, etc.	Basic tools: hoe, pick axe, cutlass, etc., Very little change in technology, except for increased use of agro-chemicals, especially for vegetables.
<b>Capital</b>	Artisanal – low capital input, particularly on local and family-owned operations.  Small scale: Increasingly capital intensive, external (particularly foreign ownership) is growing (Ghana).	Low capital input; entirely resourced by owners from the same locality. Some support from government through development programs.
<b>Water</b>	Heavily reliant on water. Mainly surface water; rivers and streams	Mainly rain-fed, some irrigation, but limited



# CHAPTER 3

## Policy and Regulatory Environment

### 3.1 Sector Policies

All three study countries have sector policies, legislation and regulations for ASM and smallholder agriculture. Thanks to the regular preparation of World Bank-supported, medium-term Poverty Reduction Strategy Papers, there is increased recognition of the role that can be played by ASM and smallholder agriculture in poverty reduction. Further, emerging regional and continental initiatives such as the Comprehensive Africa Agriculture Development Programme (CAADP), Africa Mining Vision (AMV) and ECOWAS Minerals Development Policy (EMDP) have also influenced the prevailing governance arrangements at national level in the three study countries.

**ASM:** Many African countries including the study countries are at various stages of preparing their Country Mining Vision (CMV), the national equivalent of the AMV, complementing other policy initiatives in the mining sector. The AMV envisages “transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development” (African Union, 2009).

- In Ghana, as early as 1989, the government designed an ASM-specific support framework dubbed Small-Scale Mining Project (SSMP), which aimed at developing a vibrant and environmentally responsible ASM sector through the provision of incentives including soft loans and equipment. The project did achieve the intended objectives. In 2015, the government published an ASM-specific policy framework, which emphasized government commitment to supporting the ASM sector through provision of access to finance, geological data and environmentally safe standards.
- In Sierra Leone, the Core Mineral Policy (2003) provides policy direction in the mining sector. Explicit in the policy is governmental desire to regulate, monitor and administer artisanal and small-scale mining in a manner that will create open competition, continuity and security of tenure for license holders, and make it advantageous for the miners to work within the legal system and therefore minimize smuggling.<sup>15</sup>

- Burkina Faso launched the National Plan for Economic and Social Development (PNDES) in July 2016, which identifies the mining sector as a major pillar of growth and development. This follows an old mining policy document that was published in 1997. In the country's 2005 Poverty Reduction Strategy Paper (PRSP), the government of Burkina Faso committed to ensuring better organization of ASM activities, secure gold-washing sites, improved outreach to gold washers, as well as adequate logistical and technical support to improve mining productivity and restore the environment (Government of Burkina Faso, 2004).

**Agriculture:** The Comprehensive Africa Agriculture Development Programme (CAADP) aims to contribute to the elimination of extreme poverty by 2025, ending hunger and malnutrition by 2025, making Africa a net food exporter and moving Africa to the top of export-oriented global value chains where it has comparative advantage. These objectives fairly mirror the expectations of African countries and have therefore appeared in national strategies and policies.

- In Burkina Faso, various policy documents (including PRSPs) identify agriculture in general, and specifically smallholder agriculture, as a strategic pillar for poverty reduction. The 2004 PRSP recognized agriculture's leading role in job creation, especially in rural communities, and its importance for poverty reduction. The policy framework therefore proposed programs to enhance security of food-crop farmers (who form the poorest segments and vulnerable groups in society), by reducing the vulnerability of agriculture, promoting more intensive and more modern farming; raising and diversifying rural incomes; supporting producer associations and collective infrastructure; improving living and working conditions for rural women; and promoting jobs and vocational training.

- In Ghana, there is a more comprehensive policy framework in support of agricultural development that takes into consideration regional and continental policy imperatives such as the CAADP. Since 2003, the country has prepared regular PRSPs (Ghana Poverty Reduction Strategy – GPRS I; Growth and Poverty Reduction Strategy – GPRS II; Ghana Shared Growth and Development Agenda – GSGDA I and GSGDA II) that always prioritize the agricultural sector, which in Ghana (as in the other countries) is dominated by smallholder farmers. GSGDA I (2010-2013) placed heavy emphasis on modernization of agriculture through improved productivity, increased competitiveness and enhanced integration into domestic and international markets. Further, the policy framework envisaged reducing production and distribution risks and bottlenecks in the sector. Greater focus was also placed on crop development (to improve food security as well as to support agro industries and for exports), increased livestock and poultry development, promotion of fisheries and improved institutional coordination, with objectives set. The government has also developed specific policies for the agricultural sector. These include: the Medium-Term Agriculture Sector Investment Plan (METASIP); the Food and Agriculture Sector Development Policy I & II (FASDEP I & II); the Tree Crops Policy (TCP); Ghana's Seed Policy; and the Ghana Irrigation Development Policy.
- In Sierra Leone, smallholder agriculture was identified as one of four strategic priorities in both the Agenda for Change and Agenda for Prosperity, equivalents of PRSPs, produced in 2008 and 2013 respectively. Further, the sector was seen as very important not only in achieving the then MDGs and now the SDGs, but also in attainment of middle-income status. The government, in the Agenda for Prosperity (2013) pledged to make agricultural production more efficient and commercialized and move up the value chain for sustainable economic growth and job creation. Prior to this declaration the Ministry of Agriculture, Forestry and Food Security unveiled the flagship Smallholder Commercialization Programme (SCP) in 2010. The SCP is a programme component of the National Sustainable Agricultural Development Plan (NSADP), which the government believes has the potential to achieve the greatest impact in terms of improved food security and wealth generation for the most vulnerable population in the short and medium term (Smallholder Commercialization Programme Investment Plan, 2010).

## 3.2 Sector Legislation and Regulations

In the area of regulation, this study focuses more on ASM than smallholder agriculture. This is because, compared to ASM, smallholder agricultural activities are considered and known to have far less negative environmental footprints. Nevertheless, there are regulations in all the study countries regarding the utilization of agrochemicals by smallholder farmers. Additional regulations have been developed to control the uptake of biotechnology in agricultural activities through the adoption of genetically modified foods. Recently, there have been rigorous regulations that enable the control of diseases in animal husbandry (especially poultry) in order to improve food safety and public health. In Ghana, there are quarantine regulations on livestock movement as well as regulations on fisheries.

In the mining sector, there are a plethora of laws and regulations in all the study countries that are relied upon to manage and govern the sector (Table 5).

- In Burkina Faso, the mining sector is governed by a set of national, sub-regional, regional and international legal instruments. National legal instruments include laws and regulations instruments specific to the mining sector and general legislative and regulatory instruments applicable to the mining sector (Table 5). Act No. 036-2015 is the new Mining Code that replaced the one adopted in 2003. It applies to companies engaged in prospecting, research and mining of deposits. The same law applies to processing, transport, and marketing operations. It does not apply to the water, oil and gas sectors. This code also covers industrial and semi-mechanized mining as well as artisanal gold mining.
- With regard to ASM, the permit for artisanal mining is granted to individuals. One must be of Burkinabè nationality or a national of other countries, on a reciprocal basis. A permit may be granted to cooperative companies operating in the mining sector. However, Article 71 of the Mining Code stipulates that the procedures for issuing artisanal mining permit are specified by regulation. Article 76 of the Code stipulates that the beneficiary of an artisanal mining permit shall not carry out activities on cultivated land without prior agreement with the farmers and land owners. In case of damage caused to farms, the same provision states that the holder of the operating permit shall repair the damage.

- In Ghana, ASM was first legalized and governed by the Small-scale Mining Law 1989 (PNDCL 218), now repealed. Prior to PNDCL 218, ASM activities were deemed illegal by virtue of the fact that ASM was closely linked to the use of mercury, which was banned in 1933 by the Mercury Law. The ban was lifted in 1989. Governance of the sector is now under the Minerals and Mining Act, 2006 (Act 703). The Act makes mention of “small-scale mining” although it is interpreted to include artisanal mining (which is not mentioned by the law). Small-scale mining in Ghana is reserved for nationals only and strictly defined by the size of the concession, which is about 25 acres. ASM activities in Ghana remain largely under the direct supervision of the Minerals Commission of Ghana, which serves as technical adviser to the Minister responsible for natural resources. Grassroots supervision and monitoring of ASM activities is the responsibility of the district offices of the Minerals Commission.

In Sierra Leone, the current legal framework guiding the exploration, production, marketing, and regulation of solid minerals is contained in the Mines and Minerals Act (2009). The Ministry of Mines and Mineral Resources (MMMR) administers the Act, which provides for the consolidation and amendment of the law on mines and minerals. With respect to ASM, the Mines and Minerals Act (2009) draws a clear distinction between artisanal and small-scale mining operations. The holder of an Artisanal Mining License must be a Sierra Leonean national and shall have exclusive rights to carry out exploration and mining operations in licensed areas that do not exceed half a hectare. The Director of Mines issues these licenses and regulates the mining and marketing of precious minerals produced under these licenses through the Precious Minerals Trading Department, formerly, Government Gold and Diamond Office (GGDO). A scheme for artisanal licenses, the Alluvial Diamond Mining Scheme (ADMS), has been in existence since 1956 and has been a major source of employment for unskilled labor and also a major source of revenue for Sierra Leoneans. The holder of a Small-Scale Mining License, on the other hand, has exclusive rights to carry out exploration and mining operations in licensed areas that are not less than 1 hectare and not more than 100 hectares. The validity of a Small-Scale Mining License does not exceed three years and may be renewed for further periods not exceeding three years at a time (Mines and Minerals Act, 2009).



**Table 5: Key Laws and Regulations that Govern Mining Activities**

Burkina Faso	Ghana	Sierra Leone
Act No. 036-2015 / CNT of June 26, 2015, establishing the mining code of Burkina Faso	Minerals and Mining Act, 2006 (Act 703), its amendments and their Regulations (L.I.s) notably L.I. 2173, 2174, 2175, 2176, 2177, and 2182 of 2012.	Mines and Minerals Act (2009)
Act No. 027-2011 / AN of 15th November 2011, on prevention of fraud in the marketing of gold in Burkina Faso	Environmental Protection Agency Act, 1994, established the Agency	Mines and Minerals Regulation (2011)
Act No. 006-2013 / AN establishing the Environment Code	Small-scale Mining Law 1989 (PNDCL 218); Replaced by Act 703	National Minerals Agency Act (2012)
Act No. 003-2011 / AN of 5th April 2011 establishing the Forest Code in Burkina Faso	Minerals Commission Law, 1986 (PNDCL 154) established the Commission; Replaced by the Minerals Commission Act, 1993 (Act 450) under the 1992 Constitution	Income Tax Act (2000)
Act No. 034-2012 / AN of 2nd July 2012, on agrarian and land reorganization in Burkina Faso	Minerals and Mining Law, 1986, PNDCL 153, replaced by Act 703.	Environmental Protection Act (2008)
Act No. 034-2009/AN of 16th June 2009, on rural land tenure in Burkina Faso	Minerals (Royalties) Regulations, 1987 (L.I. 1349); Replaced by Act 703	Environmental and Social Regulations (2013)



# CHAPTER 4

## Research Findings

### 4.1 Introduction

The preceding chapters provided an overview of the context in which smallholder agriculture and ASM operate in the study countries. It analyzed their proximate determinants and the policy, regulatory and institutional arrangements that influence the operations of the two sectors. This chapter, drawing on the field work conducted in the three study countries, attempts to answer the following five key questions:

- What are the effects of ASM activities on smallholder food- and cash-crop farming in selected communities endowed with minerals in the three study countries?
- What are the effects of ASM activities on women and young adults in areas where ASM is dominant and where the role of women in agriculture is paramount?
- Which of the two rural development drivers (ASM or smallholder agriculture) is likely to provide a more sustainable tool of poverty reduction in affected communities?
- What are the public policy responses to the emerging labor issues, land-use conflicts, and water resource constraints facing agriculture as a result of ASM activities? What are the regulatory gaps?
- What can government and other stakeholders do to ensure that the two economic activities can coexist to boost livelihoods and improve development outcomes?

### 4.2 Relationship between ASM Activities and Smallholder Agriculture

As a precursor to assessing the effects of ASM on smallholder agriculture, this section draws on the survey results to review the underlying determinants of the relationship as defined in the conceptual framework. The key determinants reviewed are: (a) land ownership; (b) land use, and (c) labor and capital.

**Land ownership:** Perhaps the single most important factor defining the relationship between ASM and smallholder farmers in the study countries is the structure of land ownership. It has implications for whether the relationship will be transactional/ competitive or complementary.

- a. Sierra Leone exemplifies an ownership structure that fosters a complementary and symbiotic relationship between ASM and smallholder farmers. Evidence from the survey confirms synergies between the two sources of rural livelihood, with some families reporting interchanging roles in response to the season. It is not uncommon to see a miner switching to farming at the end of the mining season which, in Sierra Leone, begins in November and ends in May, while farming commences in June and ends with crop harvest in October. Smallholder farmers according to Hilson (2016) and corroborated by this study, have always diversified their incomes to guard against risk, with many resorting to ASM, often operating in the dry season and using the income earned to support their agriculture-based livelihoods. In essence, the “farmer-miner” and his entire family are actively engaged throughout the year as observed during the survey.

While income from ASM is difficult to quantify, as it cannot be isolated from the household's other income-generating activities, the study noted that much of the income from mining is used in the purchase of seeds and other agricultural inputs used mainly in food- and some cash-crop production. Furthermore, the establishment of rural banks in mining communities has provided miners and farmers the opportunity to make savings on their incomes and access loans during difficult times. Some miners use revenues from diamond and gold mining to purchase manufactured goods sold within the communities. Weekly markets called Luma attract traders from faraway villages who sometimes exchange diamonds and gold for manufactured goods in a barter system.

Because the farmers are the same persons who run the mining sites, the two activities reinforce each other and are less transactional. But there are occasional disputes and these are around land ownership – as noted in the survey, legal ownership of land is often open to dispute, especially where it involves multiple use of water, from a single source used for mineral processing, for farming and drinking and other domestic use.

In *Burkina Faso* and *Ghana*, the picture is quite different. The ASM sector is dominated by migrants to the mineral-rich farming communities, thus, operating on “claimed” farm lands. The relationship between the miners and farmers is highly transactional and competitive, with regard to the factor inputs: land, water, labor and capital. In Burkina Faso, in three of the mining communities surveyed, ASM is dominated by non-natives due to the spiritual/mythical value attached to gold by some natives which prohibits them from engaging in economic transactions with gold. However, due to the seasonal nature of ASM<sup>16</sup>, the workers resort, during the rainy season, to smallholder farming by offering their labor, while waiting to return to favorable season. However, given the land ownership structure where most miners do not own the land but offer their labor, and the wages are much lower than in ASM, the restricted periods are often violated, leading to conflict with smallholder farmers.

In *Ghana*, ASM has been going on in resource-rich rural communities for several decades, in a relatively complementary, less competitive or non-antagonistic way. However, over the last decade there has been phenomenal growth in ASM activities in resource-rich communities, triggered by high gold prices starting in the early 2000s. Gold prices hovered around US\$300 per ounce in the early 2000s, and increased five-fold within a decade to about US\$1,500 per ounce in 2010, and peaked at about US\$1,800 in 2011. The price of gold has since eased, but has consistently been significantly higher than US\$1,000 per ounce. The gold rush that ensued brought a massive influx of non-natives and other nationals into the sector in resource-rich rural communities. Expansion of exploration and exploitation of gold into agricultural lands triggered unregulated, sometimes forceful acquisition and destruction of farm lands and livelihoods of some communities.

**b. Land use:** Like labor, land is intensively used by both ASM and smallholder agriculture. While smallholder agriculture in general does not affect the integrity of mineral resources, ASM activities (particularly the widespread open-cast surface mining) impose a heavy toll on land resources. This is because surface mining activities normally involves widespread excavation of topsoil. Further, there is ever-increasing prospecting and mining right in water bodies, including swamp lands. Several rivers and streams in Ghana have been severely affected by this development, notable among these are the Offin, the Pra and the Brim rivers. With regard to swamp lands in Ghana and Sierra Leone, there is competition between smallholder farmers and artisanal miners for swamp land, which contains fertile soil suitable for farming and which also has good potential for mineral exploitation. With expanding ASM activities and abandonment of mined-out areas and pits, a major policy imperative is how the lands are to be reclaimed for farming and other economic activities. Licensed ASM operators are often more responsible with regard to the environment than their unlicensed counterparts and most of the abandoned mines (and therefore destroyed lands) are left by unregistered ASM operators who are often able to evade capture by law enforcement agencies. In view of this, the two sectors can hardly coexist in the strict sense of the word in Ghana.

It must also be pointed out that some ASM activities involve sinking relatively narrow but deep shafts in the ground. These types require only a small surface area for mining activities that can last a couple of years or more. These types are quite popular in Burkina Faso and some parts of Ghana and can clearly coexist with smallholder farming. Consequently, land-use conflicts between ASM and smallholder agriculture are very rare in Burkina Faso, although there is growing evidence of conflict. One of the sites visited during the field work for this study had been closed due to conflict between artisanal miners and the local farming community. In Ghana, where open-cast mining is widespread, the complicated land tenure regimes have resulted in violent conflicts between smallholder farmers and ASM operators. Elites in many rural communities with some stake in land resources have preferred to allocate land to ASM operators who pay them quite well (as they do for labor) than to use such land for farming. Consequently, some farms have been destroyed on the orders of chiefs and other elites without the knowledge and consent of the farmers who cultivate crops

on those farms. Such incidents were observed mainly in Ghana and, to a lesser extent, in Sierra Leone. In Burkina Faso, however, reports from the field indicate a relatively cordial relationship between ASM operators and smallholder farmers. In some parts of Ghana, there were farmers who were also upbeat about ASM activities and expressed willingness to sell their farms to them (obviously for a good payout), raising concerns about coexistence and sustainability of the two activities.

- a. **Labor and Capital:** Intricately related to land use and land ownership are labor and capital. In general, ASM and smallholder agriculture rely heavily on labor-intensive methods with basic tools and equipment (pick-axe, shovel, hoe, cutlass, etc.). By virtue of the nature of the work, the ASM sector attracts predominantly younger workers, between the ages of 18-40. While smallholder agriculture also requires the strength and muscle of the younger population, the sector is largely dominated by older men and women. Respondents in the survey confirmed wage differentials as the dominant explanation for the attraction to ASM, despite the associated risks and short-term horizon. In the survey, it was observed that depending on the activity at the ASM site (whether one is digging or carting ore) a worker can earn between two to five times what smallholder agriculture normally offers. The higher wages in ASM sector offer operators the capacity to mobilize private capital from both formal and informal sources for investments – both for start-up seed money and working capital. As noted from survey respondents (particularly Ghana), funding (including external financing) is more readily available for ASM than for smallholder agriculture.

The capital intensity of ASM activities, however, differs from one country to the other. In Ghana, there is growing convergence between ASM and large-scale mining (LSM). Now, artisanal miners are taking over larger tracts of land, and from pick-axes, shovels and small water pumps, many have graduated to making use of heavy equipment such as bulldozers and processing plants such as the Chinese-made dredging machines. As observed in the two Western Region survey sites (Tarkwa-Simpa and Wassa Ehyireso communities) in Ghana, such massive earth moving machines are being used in ASM sites for excavation and carting the ore from one part of the mining site to another for processing. In Burkina Faso, while the use of heavy equipment is still uncommon, there is an increasing trend, as observed at ASM sites at Alga, where heavy-

duty machines are being used for crushing and grinding rocks. There were also generator plants and compressor machines to assist in drilling holes for dynamite for blasting with explosives. In Sierra Leone, however, the use of such heavy-duty machines is still very rare on ASM sites, as most activities are undertaken by manual labor.

These variations may reflect of the level of maturity of the industry in the three countries. The ASM sector in Ghana appears to have matured after over a century in operation. But perhaps, the real spark has been the recent boom in commodity prices (especially gold) and the accompanying gold rush. This exogenous factor offers a more plausible explanation for the expansion of ASM activities as well as the higher utilization of heavy-duty machines (especially in Ghana). Overall, the evidence from the study indicates increasing use of machines at ASM sites across all study countries, largely thanks to China, for making these machines readily available and at relatively lower cost. In many countries across the continent, Chinese have been reported to be directly engaged in ASM activities in direct contravention of the laws which bar foreign nationals from operating in the ASM sector.

### 4.3 Impact of ASM Activities on Smallholder Agriculture

From the analysis of the key variables defining the relationship between the two sources of rural livelihood discussed above, the preponderance of the evidence suggests that the impact is more negative than positive, although in Sierra Leone, it was found to be more complementary. With regard to the negative impact, five outcomes are discernible.

- ***First is the growing imbalance in the power relationship between ASM miners/ entrepreneurs and smallholder farmers in resource-rich communities***, particularly in Ghana and Burkina Faso. In Ghana, farmers are being enticed to sell their land, and in some cases, there has been forceful dispossession of cocoa farms where the gold reserves discovered are substantial. The survey results show that close to half (43%) of farmers interviewed were very willing or willing to sell their farmland to ASM entrepreneurs, and only 16% would not sell at any cost. This is a significant number, and clearly reflects the wide income disparity between the two sources of livelihood. In communities where the preponderance of land is owned by farmers, the chances of land grabbing by ASM



entrepreneurs are very high. In all the survey districts in Ghana, at least 50% of respondents have lost their farms to ASM operators (Table 6), of which 53% were for cash crops and 40% for food crops (**Figure 3**).

- **Second is the growing overvaluation of assets in resource-rich rural communities, increasing the vulnerability of rural households – a localized Dutch disease.** The rapid influx of capital and the quick returns from ASM has led to massive price escalation in mineral-rich communities, as the demand for services and material supplies is rising much faster than supply. Farmers have been known to cash in on the sale of their farmlands to build new houses and invest in other activities.

Perhaps the most damaging effect on smallholder agriculture is the growing cost of farm labor. Labor is an input used intensively by both sectors; already, most of the rural youth have migrated to towns and cities in search of jobs that do not exist in rural areas. The study shows that the expansion of ASM activities and resultant high demand for labor has worsened the situation for smallholder agriculture, culminating in two important negative consequences: first, labor has become more expensive to hire for farmers – ASM entrepreneurs are outbidding smallholder farmers in the labor market by a ratio of 3:1 – and second, farm labor has become increasingly difficult to find. As a result, most of the rural youth

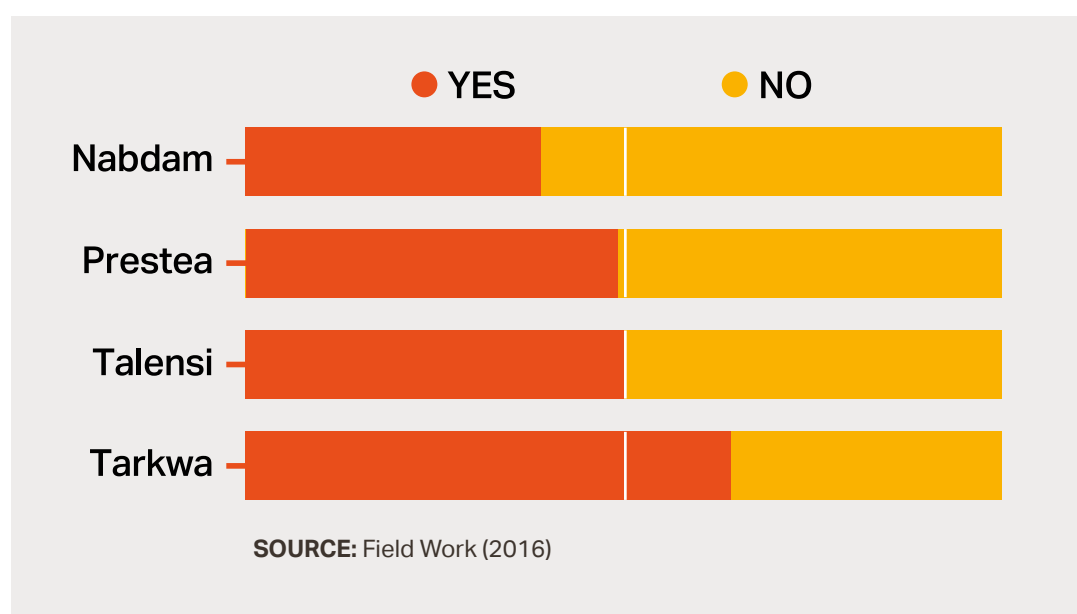
who can establish and maintain farms are more oriented towards working in the ASM sector and have thus been moving from one ASM site to the other in search of employment. This is in spite of the greater health risks and drudgery associated with ASM activities.

- **Third is the growing threat to food security, the reduction in available arable land and consequent reduction in food- and cash-crop production.** In all three study countries, increasing land degradation (symptomatic of neglect and lack of reclamation of mined-out sites) is seriously threatening efforts at promoting commercial agriculture. In Sierra Leone, public officials interviewed are concerned about the threat of ASM to the government's flagship Smallholder Commercial Programme which aims to shift the paradigm from subsistence to commercial agriculture. Similar concerns were expressed by stakeholders interviewed in Ghana and Burkina Faso.

**Table 6: Land Destroyed by ASM**

Farm Product	Response
Cash crop	52.5%
Food crop	40.0%
Both	5.0%
Fallow land	2.5%
Other	0.0%

**Figure 3: Farms lost to ASM  
(last 3 years years)**



Furthermore, competitiveness of smallholder agriculture is being eroded, accompanied by relatively higher prices of foodstuffs. This obviously threatens the already fragile food security situation of rural communities and questions the complementary role of ASM. The situation is worsened by the low productivity that characterizes farming activities, resulting in low yields, low revenue and low profits. As more of the youthful labor force shows little or no interest in farming, there are major concerns about deterioration in overall agricultural production in these communities and the medium- to long-term development impact. In Kono and Tonkolili districts in Sierra Leone where mining activities have a fairly long history, observations from the study suggest that food and cash crops in the local markets are cultivated by smallholder farmers in non-mining communities. This clearly demonstrates that where artisanal mining becomes the dominant occupation, there is usually low production of food and cash crops. This same phenomenon was observed in Ghana (Upper East Region) and in Burkina Faso.

- ***Fourth are the environmental and health risks resulting from unregulated ASM activities.***

The country studies, like several other similar studies, observed major negative impacts on the environment resulting from ASM activities. Key among them is pollution of land, water resources and air. In Ghana and Sierra Leone in particular, many mined-out areas have not been reclaimed, resulting in ever-decreasing cultivable land. Even when mined-out areas are properly back-filled, it takes several years before they can be used for some agricultural purposes. Therefore, the widespread abandonment of mined-out areas constitutes a major environmental challenge with significant consequences for smallholder farmers, particularly women. The pollution of water bodies is also a major concern, which recently in Ghana, triggered nationwide condemnation of degradation of the environment by ASM operators. However, they continue to operate with impunity.

In all the communities visited across the three study countries, not a single worker at ASM sites had protective gear. Unregulated ASM means that the occupational hazards are huge. In Ghana and Sierra Leone, several reported deaths were occasioned by mine collapses, operating particularly during the prohibited rainy season. During the survey, at sites visited in Ghana, there were many abandoned sites close to residential areas that were not only serving as breeding

grounds for mosquitoes, but also contained high levels of residual chemicals such as mercury and cyanide. The situation in Sierra Leone was no different. In Yengema, Kono District and Makong, there were many such abandoned sites that had become artificial lakes containing water with high levels of chemical residuals. In Burkina Faso, however, these incidents (artificial lakes created by abandoned mines or cave-ins) were very rare. This is largely because most ASM activities in the country take place on high ground in which deep shafts are sunk to dig ore bodies that contain the minerals (mainly gold). There is also better compliance with off-season restrictions – the cessation of operations during the rainy reason. The bottom line, however, is that the negative environmental footprints of most ASM activities make it difficult for the sector to play a complementary role to smallholder agriculture in mineral-rich rural communities.

- ***Fifth is the impact on women and youth.***

Women are increasingly involved in hazardous ASM activities. Across the study countries, it is common to find very young boys and girls engaging in all manner of activities, with girls in particular carting prepared ore on their heads from one part of a mining site to another, to be panned for gold. This task follows digging or excavation of the ore, usually by young men with basic tools such as pick-axes and shovels, and as usual in most of these activities, most of these women hardly put on protective gear. In survey sites in Ghana, some of the women were found with their children at the sites, endangering not only their education and careers but also their lives, given the harmful conditions in which they work. Since most of these same women play very important roles in smallholder agriculture, the consequential effects on agriculture can be significant. In addition to these direct effects, the study also shows that in all three countries, the indirect burden of ASM activities is even more severe on women; these include the rising cost of foodstuffs and other household needs and the drudgery of walking longer distances to fetch water and firewood, as most of the nearby streams are either dried up or contaminated and forest areas laid bare by clearing of wide expanses of land for ASM activities.

**Positive impact:** Although the downside risks are high, there are examples of some positive outcomes and complementary roles of the two sources of rural livelihood. These include job creation in rural communities; supplementary income (a safety valve) for many smallholder farmers to enhance food security; and productivity through financing of

agricultural inputs, such as fertilizers and other inputs, and the generation of aggregate demand for off-farm household supplies and services.

These positive outcomes are better manifested in the Sierra Leone case study, where the term “farmer-miner” is popular. In Sierra Leone, both ASM and smallholder agriculture are organized largely as family businesses and the majority of rural families straddle the two activities (whose peak seasons are complementary). Survey respondents<sup>17</sup> confirm that the same pool of labor tends to shuttle between these two sectors during the course of the year. And this shuttling is not limited to labor only, but also to entrepreneurs who were found to combine both activities. Thus, the synergy between the two sectors is enhanced.

In all three countries, the positive impact of ASM activities is better manifested in the operations of small-scale miners (SSM) than in those of artisanal miners (AM). First, the small-scale miners are more likely to operate within the formal sector with operating permits and are therefore more compliant with the regulations than artisanal miners. Second, some of these formal SSMs engage in corporate social responsibility (CSR) activities in the communities in which they operate. The study shows that some also operate formal offices and provide formal jobs.

#### 4.4. Policy and Regulatory Gaps

The previous section, drawing on the survey data, highlighted some of the observable impact of ASM activities on smallholder agriculture in mineral-rich rural communities, and noted an overwhelmingly negative footprint. This section identifies some of the key policy and regulatory issues in the mining sector which, if addressed, could help mitigate some of the negative impact. The objective is to assess the gap between policy and regulatory intentions on one hand, and on the other hand, what actually happens on the ground. From the review and survey data, two types of gaps are discernible: (a) policy and regulatory inadequacies; and (b) implementation or enforcement deficiencies.

- Policy and regulatory inadequacies.** The distinction between artisanal mining and small-scale mining is blurred. This is unique to Ghana and has made enforcement difficult. In Ghana, even though the government recognizes different levels of operation in the ASM sector, it subsumes all under “Small-Scale Mining (SSM)” (Minerals Commission, 2015). This position is largely informed by provisions in the law which makes

no distinction between different levels or scale of activities in the ASM sector as is the case in Sierra Leone and Burkina Faso. As a matter of fact, the word “artisanal” does not appear in the law that establishes the legal framework for the sector (Minerals and Mining Law 2006, Act 703). And over the past three decades that the sector has been operating legally (as the ban on mercury usage was lifted in 1989), there has not been any official categorization distinguishing the two. This obviously makes monitoring and control of the sector much more difficult. Technically, the regulations covering artisanal miners (using pick-axes and shovels) cannot be the same as those covering small-scale miners using heavy-duty machines. Despite the same treatment of the operators in ASM by regulatory authorities, there are marked differences in the way they operate (both in terms of scale, intensity of factor usage and involvement of foreigners). But perhaps, as noted earlier in the study, the practice is catching up with the law, as artisanal miners are now using heavy-duty equipment.

In Burkina Faso and Sierra Leone, the laws are clear on the distinction between artisanal and small-scale mining. In Burkina Faso, the Mining Code adopted in 2015 grants permits for artisanal mining to individuals of Burkina Faso origin but also to nationals of other countries provided it is reciprocated by their governments.

Sierra Leone’s Mines and Minerals Act (2009) exemplifies clarity in regulation. It draws a clear distinction between artisanal and small-scale mining operations. The holder of an Artisanal Mining License has exclusive rights to carry out exploration and mining operations in licensed areas that do not exceed half a hectare. The period of the Artisanal Mining License shall not exceed one year and may be renewed for up to three further periods (Mines and Minerals Act, 2009). Under this Act, only Sierra Leonean nationals are eligible to apply for an Artisanal Mining License. The Director of Mines issues these licenses and regulates the mining and marketing of precious minerals produced under these licenses through the Precious Minerals Trading Department, formerly the Government Gold and Diamond Office (GGDO). A scheme for artisanal licenses, the Alluvial Diamond Mining Scheme (ADMS), has been in existence since 1956 and has been a major source of employment for unskilled labor and also a major source of revenue for Sierra Leoneans. The holder of a Small-Scale Mining License has exclusive rights to carry out exploration and mining operations in licensed areas that are not

less than one hectare and not more than 100 hectares. The period of the Small-Scale Mining License does not exceed three years and may be renewed for further periods not exceeding three years at a time (Mines and Minerals Act, 2009).

**Implementation challenges:** Compliance and enforcement are two major implementation challenges observed in the study in the countries, which if properly addressed, could mitigate some of the negative impact noted earlier.

- First, the rules and regulations are flouted with impunity in the study countries. In Ghana, the government has granted a little over 1,000 small-scale mining licenses, which is for less than a third of the entrepreneurs directly engaged in the sector – a clear manifestation of weak enforcement. Although ASM operators in the study countries appreciate the need to conduct their activities under the watch of regulatory agencies and by obtaining requisite permits and conducting their activities as provided for in the laws and regulations, they are faced with two key challenges. The first is the cost (including hidden costs) involved in going through the proper process; this is a big deterrent. The second is the time it takes to get a permit. In Ghana, it can take an ASM operator years to complete a process that was meant to take 3 to 6 months.
- Second, there is a more fundamental problem of compliance with rules and regulations, such as mining in areas that fall outside the concession granted; mining close to river bodies and even in the rivers; undertaking mining activities with a prospecting license rather than a mining license; or not observing the guidelines regarding mining seasons (prohibition during the rainy season). The worst violations are by those operating mining activities in major river bodies. These are all violations noted in the three study countries.
- Third, is the itinerant nature of most ASM activities. This is primarily due to absence of proper geological mapping, leaving ASM prospectors with little guidance on the demarcation of reserved and non-reserved areas in which to operate. With ASM operators not adequately informed about the reserve potential of a concession, taking the steps to obtain all requisite permits seems sub-optimal due to concern that the area may not be viable. Government agencies responsible for bringing ASM operators under regulation must, therefore, give serious consideration to these challenges.

- Fourth, is weak implementation follow through. Following through in the execution of declared policies and legally issued regulations is lacking. All three study countries are replete with initiatives that have been designed to regularize ASM activities that have either not been fully implemented or have been abandoned in the middle of implementation. In Ghana, the Small-Scale Mining Project (SSMP), designed in 1989, aimed to develop a vibrant and environmentally responsible ASM sector through the provision of incentives including soft loans and equipment, but was poorly implemented. The project involved four key mining sector agencies at conception, but was left for the Minerals Commission alone to implement soon after the initial project tasks were performed and other agencies abandoned their responsibilities (Hilson, 2001). The fate of the well-conceived but poorly implemented SSMP has affected almost all subsequent major policy initiatives aimed at supporting and bringing the sector under proper regulation.
- The situation in Burkina Faso and Sierra Leone is not significantly different. In Sierra Leone, the government was a founding member of the Kimberly Process Certification Scheme established to prevent revenues realized from the sale of smuggled mineral resources ("conflict diamonds") from being used to perpetuate armed conflicts. However, there are lingering concerns and evidence that smuggling of mineral revenues continue. This is in spite of the government's full support for the realization of the aims and objectives of the international trading protocols used for the import and export of rough diamonds.

In sum, government intentions and expectations for the ASM sector (and smallholder agriculture as well) as expressed in various policy documents, laws and regulations hardly work in reality owing largely to poor implementation and lack of enforcement. It is no wonder that almost a decade after the adoption of the African Mining Vision and the ECOWAS Minerals Development Policy (EMDP), concrete steps towards their implementation are yet to be initiated, beyond professing at various gatherings the readiness to implement these policy initiatives.





# CHAPTER 5

## Summary, Concluding Observations and Policy

### 5.1 Summary

This study has sought to add to existing knowledge on the intricate and dynamic relationship between two key sources of rural livelihood – ASM and smallholder agriculture. The underlying objective has been to explore whether ASM can sustainably provide complementary livelihoods to smallholder agriculture in the communities where it is widespread. Thus, the study spotlight has been primarily on ASM (and not on smallholder agriculture) because of the serious threat that unregulated artisanal mining poses to agriculture and food security in affected communities. The summary below is presented in accordance with the proximate determinants defined in the conceptual framework: land ownership, land use, labor and capital.

**Land ownership:** The study notes that the structure of land ownership is perhaps the single most important factor defining the relationship between ASM and smallholder farmers. It defines whether the relationship will be transactional/competitive or complementary. The study shows how the structure of ownership in Sierra Leone – the farmer-miner arrangement – fosters a harmonious relationship between the two activities, while in Ghana and Burkina Faso the dominance of non-indigenes in ASM operations has led to transactional and often conflictual relationships with farm land owners – mainly smallholder farmers.

**Land use:** The study shows that the intensity of land use and the itinerant nature of ASM are key determinants of the relationship with smallholder farmers. Burkina Faso and Ghana manifest strong transactional and competitive relationships between these two sources of rural livelihood. As noted in the study, there have been several instances of conflict between farming communities and ASM operators in Burkina Faso and Ghana. Even in Sierra Leone where less tension was observed (due to the farmer-miner structure of the two operations observed), it was obvious that there was fierce competition between artisanal miners and smallholder farmers for swamp lands, which contain fertile soil suitable for farming

and also for mineral exploitation. Many stakeholders hold the view that swamp lands should be ring-fenced for rice and vegetable cultivation. So far, policies and legislation have failed to address these emerging land use issues in all three countries.

**Labor and Capital:** So far, Sierra Leone has been spared this insidious dynamic due to the farmer-miner structure of the operations and the adherence to the off-season regulation. However, with increasing use of heavy earth-moving and dredging equipment in artisanal mining, the distinction between artisanal and small-scale mining is becoming blurred, particularly in Ghana and Burkina Faso. In Sierra Leone, the intensity of capital infusion is still low, due to stricter adherence to the regulations as well as the continuing dominance of the farmer-miner occupational structure.

**Environmental and social impact:** Perhaps the single most important reason why ASM can be judged to be incompatible with smallholder agriculture is its huge negative environmental and social footprints. In this study, evidence captured in photographs and video clips clearly portray some of the negative impact, which includes diversion of streams into mine sites, contamination caused by mineral processing and lowering of the groundwater table occasioned by dewatering of mine pits. Also noted are widespread abandoned sites close to communities, serving as breeding ground for mosquitoes and containing high levels of residual chemicals (such as mercury and cyanide) which constitute major health hazards to the communities.

**Policy Recommendations:** The study countries have agencies responsible for environmental management that play a substantial role in regulating mining activities. Unfortunately, most ASM operators are outside the remit of the law and are therefore not properly regulated by these agencies. Local governments in the three countries also exercise some responsibility in ensuring that all economic activities undertaken in their jurisdiction meet some environmental sustainability standards; yet, enforcement is weak.

## 5.2 Concluding Observations

This section summarizes the responses to the key questions raised in the study and offers some concluding observations. The key questions are: (a) What are the effects of ASM on smallholder agriculture and on women and young adults? (b) Could ASM be seen as a sustainable tool for rural poverty reduction? and (c) How effective are policy and regulatory responses to the challenges confronting the ASM sector?

### *Effects of ASM on smallholder agriculture*

Survey data have demonstrated that the impact of ASM activities on smallholder agriculture is overwhelmingly negative. The study notes five major negative effects:

- The growing imbalance in power relations between the itinerant ASM entrepreneurs and workers on the one hand and sedentary smallholder farmers on the other.
- The growing overvaluation of assets in resource-rich communities, increasing the vulnerability of rural household and undermining efforts to reduce poverty.
- The growing threat to food security, the reduction in available arable land and consequent reduction in food and cash-crop production.
- The environmental and health risks resulting from unregulated ASM activities.
- The negative impact on women and young adults.

The boom in mineral commodity prices compared to agroforestry commodity prices since the 2000s has turned ASM into a “high-value” activity, tilting the balance in bargaining power in favor of ASM. Unregulated, this is leading to forceful possession of food and cash-crop farmlands, and resultant tensions and conflicts. The study notes, however, that this phenomenon is far more pronounced in survey districts in Ghana than in Burkina Faso, and is almost nonexistent in Sierra Leone, where there is considerable overlap among the key actors in the two sectors due to the farmer-miner occupational structure.

What is important to note in this dynamic is that the *perceived high financial returns to capital in the ASM sector are attracting all types of entrepreneurs, who are changing the political economy at both district and national levels.* The high percentage of ASM operators without permits is symptomatic of regulatory capture, as manifested by several failed

attempts over the years to regulate the sector. ASM is now a big business in Ghana, run by mobile phone from national and regional capitals. The workers (galamseys) who in the past owned the operating assets (pick-axes, shovels, pans etc.) are now contract workers for entrepreneurs who own heavy-duty earth-moving and dredging equipment. This is changing the fundamental structure of the industry. The distinction between artisanal and small-scale mining is now very blurred in Ghana, and in fact, the practice has caught up with regulations that are silent on this distinction. If this trend in capital/labor substitution continues, artisanal mining may no longer be considered a highly labor-intensive, labor-absorbing activity and thus cannot be seen as one of the sustainable pathways for job creation and poverty reduction in the mineral-rich rural communities.

Burkina Faso and Sierra Leone may be able to avoid this changing industry landscape if the regulations are strictly enforced, ensuring that artisanal mining remains artisanal, using basic tools and that the workers own the tools. However, market forces – higher commodity prices attracting more capital and technology into the sector – may shift the dynamics, over the medium term, towards the Ghanaian experience.

### **Can ASM be a sustainable tool for poverty reduction in resource-rich communities?**

The preponderance of evidence from this study suggests that this is highly unlikely. Two factors make this an unlikely tool for rural poverty reduction. First is the non-renewable nature of the commodity and thus the itinerant nature of the sector, and second is the changing structure of the industry.

The exhaustible nature of the commodity inherently defines the itinerant nature of the sector. Shifting from one location to another every two to three years, even if regulated, will ultimately lead to displacement of farmlands, threatening both food security and external earnings. As the commodity is exhaustible, it cannot be a sustainable medium- to long-term source of income for communities. The study shows mined-out communities virtually becoming ghost towns and devastated farmlands marked by huge pools of mosquito-infested, chemically polluted pools, and dried-up streams.

The changing structure of ownership of factor inputs (from pick-axes and shovels to heavy-duty earth-moving and dredging machines) and, in particular, increasing capital flows from external sources, implies two outcomes:

- a. Job-creation potential would be limited due to capital-labor substitution. The notion that artisanal mining is a safety valve for the demographic bulge was perhaps valid five years ago and only for the short-term due to the factors mentioned above.
- b. Most of the earnings from the sector are financing investments and consumption in the national and regional capitals and only a little trickle down to the communities. Thus, as a poverty fighter, the evidence is not compelling from this study, at least in the Ghana case. And in Sierra Leone and Burkina Faso, where the downside risks are moderate, the evidence from the study suggests a growing convergence with the Ghanaian experience.

### Effectiveness of policy and regulatory responses to the challenges posed by ASM

As indicated earlier, the governance arrangements are reasonably good in all three countries, but the regulatory responses are weak. Whereas in Ghana the regulatory provisions for artisanal mining (distinct from small-scale mining) are not explicit, Burkina Faso and Sierra Leone are very explicit in the requirements for artisanal mining. This deficiency in the Ghana small-scale mining code needs examining. The main challenges in policy and regulatory responses involve compliance and enforcement. Licensing is very weak in all the study countries, but much worse in Ghana where less than of third of ASM operators have permits. In addition to mining without permits, the lack of compliance and weak enforcement of environmental and health requirements are a major concern in all three study countries. In Ghana, these violations may be partly due to regulatory capture.

## 5.3 Policy Recommendations

### What can be done by the authorities and other stakeholders to ensure that ASM can coexist sustainably with smallholder agriculture to improve development outcomes in mineral-rich rural communities?

As evident from this study, there are policy responses which, if effectively implemented, would mitigate to some extent the negative effects outlined in the previous sections. In short, the devil is in the implementation. However, it must also be recognized that for the two sources of rural livelihood to sustainably coexist, it would take strong and determined political leadership to manage and mitigate the huge and inherent downside risks

associated with ASM. Unfortunately, the headwinds are in the direction of continuing tension and conflict.

As gold and diamonds are non-renewable commodities, there are three keys to mitigating the negative impacts of ASM on the livelihood of mineral-rich rural communities, two of which are addressed in this report: (a) filling the gaps in regulatory response and strengthening institutional capacity to plug the loopholes; and (b) strict enforcement of the already well-articulated policies and regulations. The third recommendation – addressing the longstanding challenges confronting smallholder agriculture (such as low productivity and inadequate financial, logistical and technical support) — is not the focus of this study, as indicated from the outset. This is a major topic in itself, and has been a subject of many studies and a more recent study by ACET.<sup>18</sup>

**Filling the gaps in regulatory response:** The regulatory landscape for ASM needs to be improved in all the study countries. The details need to be updated to suit current trends of ASM activities. The current laws in the study countries perceive ASM as a century-old, pick-axe-and-shovel activity. This does not help in the regulation of the sector. The laws must be revised and institutions revamped to be able to better align policies and regulations to evolving industry trends and vice versa. There are two specific areas that merit consideration:

- **Land use:** The lack of an effective regulatory response to land use issues is partly responsible for the indiscriminate expansion into cash-crop farmland by ASM operators. None of the countries under study has a comprehensive geological mapping and land-use plan identifying areas of minerals reserve potentials, and guiding the utilization of land resources for other purposes. This is key to the mutual coexistence of the two sectors and the promotion of sustainable growth and development of rural communities. Already the ASM sector is wreaking significant damage to agricultural land and the only way to reverse that sad trend is through rigorous land-use management interventions, proper demarcation of areas for cash and food crops and those reserved for ASM activities.

Concretely, governments and key stakeholders in the study countries should, through pragmatic policy formulation and legislation, demarcate areas exclusively for artisanal mining. This implies that comprehensive, professional geological mapping has to be undertaken. To avoid conflicts that usually arise from competing land use, the cadaster or land-use system administration should be extended to all parts of the countries.

To optimize winnings from gold and diamonds, governments should organize regular training programs for artisanal miners on improved low-cost techniques. This is particularly important in Sierra Leone and to some extent in Ghana, where dredging of river beds has become common. As alluvial sources become depleted, there should be a gradual shift from ASM to smallholder farming with efforts made to accelerate attainment of food self-sufficiency.

- **Capital-labor substitution effects:** The question is, would this fast-growing trend undermine the job-creation potential that the ASM sector is being touted to provide? The study shows that about 1 million persons are engaged in ASM in Ghana, 300,000 in Sierra Leone and about 200,000 in Burkina Faso. If ASM is seen as a major pathway to rural job creation and therefore improvement in the livelihood of mineral-rich communities, then this emerging trend can be regarded as a manifestation of market failure, requiring state intervention. In this regard, the regulations will have to focus particularly on restricting the use of heavy earth-moving and dredging equipment at artisanal mining sites. Ghana, therefore, has to learn from both Sierra Leone and Burkina Faso, which make a clear distinction between artisanal mining and small-scale mining.

Would such a market intervention be a viable regulatory response? Would it sustainably reduce poverty in these communities? The answer to these questions, as the study shows, is that new regulations are unlikely to achieve the intended outcomes. Such regulations will be extremely difficult to enforce in any of the study countries, and particularly in Ghana where regulatory capture seems evident. It would seem that more traction could be gained by focusing on enforcing existing regulations than by introducing new ones. In particular, supporting artisanal miners (the workers) with resources and training to engage effectively in their trade, and closely regulating licensing would be an effective regulatory response.

#### **Strict enforcement of policies and regulations:**

Enforcement has been a challenge due to three factors (a) regulatory capture; (b) weak institutional capacity; and (c) weak coordination. Regulatory capture requires the political will to dismantle existing patronage structures that prevent the effective implementation of rules and regulations. In Ghana, some change is beginning to occur with the moratorium on ASM in order to address the root causes. Adequate resources for training, monitoring and enforcement would be required. The current institutional arrangements that empower the regional and district leadership need to be strengthened; coordination among key stakeholders also needs strengthening. In particular, the capacity of the Environmental Protection Agency needs to be strengthened at regional and district levels.





## ANNEXES

### ANNEX 1: Detailed Description of Phases Involved in the Conduct of the Study

The research project that generated this report was executed in three distinct phases. The first phase involved preparation of the project proposal by the ACET research team and a request for support from the Ford Foundation. Subsequent to these were the selection of country consultants through competitive bidding and an inception meeting between the ACET research team and country consultants to devise an implementation strategy for executing the project. All these took place in 2015 and early 2016.

The second phase involved the conduct of country studies and delivery of country draft reports. The country studies were conducted using methodological approaches agreed during the inception meeting. These approaches involve proper appraisal of the key stakeholders in the ASM and smallholder agriculture sector and their involvement in key aspects of the study (particularly data collection and validation). Following this was collection of the data (both primary and secondary) required to address the key research questions that guided the studies. The second phase ended with the drafting and submission of country reports.

The third and final phase involved preparation of the synthesis report using the country studies and additional background literature.

### ANNEX 2



**Figure 4: Images of High Concentration of Labor and Use of Simple Tools in ASM in Ghana**

**SOURCE:** Citifmonline.com and Dailyguideafrica.com



**Figure 5: Images of Increasing Use of Heavy-Duty Machines at Some ASM Sites in Ghana**

SOURCE: Quicknewsgh.com



**Figure 6: Artificial Pools Created in the Aftermath of ASM Activities in Sierra Leone**

SOURCE: Field Work (2016)



**Figure 7: Women Gold Miners in Mathunkara, Tonkolili District in Sierra Leone**

SOURCE: Field Work (2016)



## FOOTNOTES

- 1 Mwaipopo, R., Mutagwaba, W., Nyange, D. and Fisher, E. (2004). Increasing the contribution of artisanal and small-scale mining to poverty reduction in Tanzania. Dar es Salaam: UK Department for International Development (DFID).
- 2 <http://www.iied.org/iied-shines-light-small-scale-mining>
- 3 <http://www.aljazeera.com/indepth/opinion/2014/07/artisanal-gold-mining-west-afric-20147372739374988.html>
- 4 Hilson and Garforth (2012).
- 5 Evidence from the survey confirms synergies between the two sources of rural livelihood, with some families reporting interchanging roles in response to the season.
- 6 Off-season is the raining season when the occupational risk-cave-ins, etc., are very high, and regulation forbid extraction during the period.
- 7 An in-depth treatment of smallholder agriculture can be found in the recent ACET flagship report on agricultural transformation in Africa "African Transformation Report, 'Agriculture Powering Africa's Economic Transformation ACET 2017'.
- 8 Mwaipopo, R., Mutagwaba, W., Nyange, D. and Fisher, E. (2004). Increasing the contribution of artisanal and small-scale mining to poverty reduction in Tanzania. Dar es Salaam: UK Department for International Development (DFID).
- 9 <http://www.iied.org/iied-shines-light-small-scale-mining>.
- 10 <http://www.aljazeera.com/indepth/opinion/2014/07/artisanal-gold-mining-west-afric-20147372739374988.html>.
- 11 Hilson and Garforth (2012).
- 12 Hayes (2008).
- 13 AGRA (2013).
- 14 (Ghana Statistical Service, 2014).
- 15 Core Mineral Policy, 2003.
- 16 The laws prohibit ASM operations during the rainy season due to landslides and associated risks.
- 17 In Sierra Leone 75% of respondents were engaged in ASM and farming, in Ghana the proportion was 32%.
- 18 An in-depth treatment of smallholder agriculture can be found in the recent ACET flagship report on agricultural transformation in Africa "African Transformation Report, 'Agriculture Powering Africa's Economic Transformation ACET 2017'.



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A Case Study of Burkina Faso, Ghana and Sierra Leone

**SYNTHESIS REPORT OCTOBER 2017**



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