

Document of  
The World Bank

**FOR OFFICIAL USE ONLY**

Report No: PAD 1177

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL CREDIT

IN THE AMOUNT OF SDR 32.7 MILLION  
(US\$45 MILLION EQUIVALENT)

TO THE

UNITED REPUBLIC OF TANZANIA

FOR

THE SUSTAINABLE MANAGEMENT OF MINERAL RESOURCES PROJECT

April 16, 2015

Energy and Extractives Global Practice  
Eastern Africa Country Cluster 1  
Africa Region

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

## CURRENCY EQUIVALENTS

(Exchange Rate Effective {3/31/2015})

Currency Unit = SDR  
SDR 1.37950 = US\$1  
US\$ 0.7249 = SDR 1

## FISCAL YEAR

January 1 – December 31

## ABBREVIATIONS AND ACRONYMS

AF	Additional Financing	IDA	International Development Association
ASM	Artisanal and Small Scale Mining	LGA	Local Government Authorities
ASGM	Artisanal and small-scale gold mining	LSM	Large Scale Mining
CODELCO	Corporación Nacional del Cobre de Chile	MEM	Ministry of Energy and Minerals
COE	Centers of Excellence	MKUKUTA	Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania (National Strategy for Growth and Reduction of Poverty)
EA	Environmental Assessment	PAD	Project Appraisal Document
EITI	Extractive Industries Transparency Initiative	PDO	Project Development Objective
ENAMI	Empresa Nacional de Minería	PML	Primary Mining License
EPA	Environmental Protection Agency	PMT	Project Management Team
EPP	Environmental Protection Plan	PNDC	Provisional National Defence Council
ESMF	Environmental and Social Management Framework	RAP	Resettlement Action Plan
ESIS	Environmental and Social Impact Statement	RMO	Resident Mines Office
EITI	Extractive Industries Transparency Initiative	RPF	Resettlement Policy Framework
FDI	Foreign Direct Investment	SDR	Special Drawing Rights
GPN	General Procurement Notice	SESA	Strategic Environmental and Social Assessment
GoT	Government of Tanzania	SGP	Small Grants Program
GST	Geological Survey of Tanzania	SMMRP	Sustainable Management of Mineral Resources Project
GRS	Grievance Redress Service	STAMICO	State Mining Corporation
IBRD	International Bank for Reconstruction and Development	TIB	Tanzania Investment Bank
		TGC	Tanzania Gemological Center
		US	United States
		VAT	Value Added Tax
		ZMO	Zonal Mines Office

Regional Vice President:	Makhtar Diop
Country Director:	Philippe Dongier
Senior Global Practice Director:	Anita Marangoly George
Practice Manager / Manager:	Christopher G. Sheldon
Task Team Leader:	Mamadou Barry



**UNITED REPUBLIC OF TANZANIA**  
**ADDITIONAL FINANCING FOR THE SUSTAINABLE MANAGEMENT OF**  
**MINERAL RESOURCES PROJECT**

**Table of Contents**

<b>Additional Financing Data Sheet.....</b>	<b>i</b>
<b>I. Introduction .....</b>	<b>1</b>
<b>II. Background and Context .....</b>	<b>1</b>
<b>III. Rationale for Additional Financing.....</b>	<b>4</b>
<b>IV. Proposed Changes.....</b>	<b>7</b>
<b>Annex I: Results Framework.....</b>	<b>24</b>
<b>Annex II: Detailed Project Description.....</b>	<b>29</b>
<b>Annex III: Lessons of ASM Development: Case Studies of Chile and Ghana .....</b>	<b>38</b>
<b>Annex IV: Economic and Financial Appraisal .....</b>	<b>44</b>



**ADDITIONAL FINANCING DATA SHEET**

*Tanzania*

*TZ Sustainable Management of Mineral Resources (P151124)*

*AFRICA*

*GEEDR*

<b>Basic Information – Parent</b>							
Parent Project ID:	P096302			Original EA Category:	B - Partial Assessment		
Current Closing Date:	30-Jun-2015						
<b>Basic Information – Additional Financing (AF)</b>							
Project ID:	P151124			Additional Financing Type (from AUS):	Scale Up		
Regional Vice President:	Makhtar Diop			Proposed EA Category:	B - Partial Assessment		
Country Director:	Philippe Dongier			Expected Effectiveness Date:	31-Aug-2015		
Senior Global Practice Director:	Anita Marangoly George			Expected Closing Date:	31-Dec-2018		
Practice Manager/Manager:	Christopher Gilbert Sheldon			Report No:	PAD1177		
Team Leader(s):	Mamadou Barry						
<b>Borrower</b>							
Organization Name		Contact	Title	Telephone	Email		
Ministry of Energy and Minerals		Idrisa Katela	Coordinator	255 22 2138944	ykatela@yahoo.com		
<b>Project Financing Data - Parent ( Sustainable Management of Mineral Resources-P096302 ) (in USD Million)</b>							
Key Dates							
Project	Ln/Cr /TF	Status	Approval Date	Signing Date	Effectiveness Date	Original Closing Date	Revised Closing Date
P096302	IDA-45840	Effective	09-Jun-2009	22-Jul-2009	22-Sep-2009	30-Jun-2014	30-Jun-2015

Disbursements									
Project	Ln/Cr/TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Undisbursed	% Disbursed
P096302	IDA-45840	Effective	XDR	33.50	33.50	0	33.50	0	100
Project Financing Data - Additional Financing TZ Sustainable Management of Mineral Resources ( P151124 )(in USD Million)									
<input type="checkbox"/> Loan <input type="checkbox"/> Grant <input type="checkbox"/> IDA Grant <input checked="" type="checkbox"/> Credit <input type="checkbox"/> Guarantee <input type="checkbox"/> Other									
Total Project Cost:		50.00		Total Bank Financing:		45.00			
Financing Gap:		0.00							
Financing Source – Additional Financing (AF)								Amount	
BORROWER/RECIPIENT								5.00	
International Development Association (IDA)								45.00	
Total								50.00	
Team Composition									
Bank Staff									
Name		Role		Title		Unit			
Mamadou Barry		Team Leader (ADM Responsible)		Sr Mining Specialist.		GEEDR			
Gisbert Joseph Kinyero		Procurement Specialist		Procurement Specialist		GGODR			
Michael Eriu Okuny		Financial Management Specialist		Sr Financial Management Specialist		GGODR			
Claire Louise Greer		Team Member		Operations Analyst		GEEDR			
Mei Wang		Counsel		Senior Counsel		LEGAM			
Rachel Bernice Perks		Team Member		Mining Spec.		GEEDR			
Ruma Tavorath		Safeguards Specialist		Senior Environmental Specialist		GENDR			
Tatianna Guerrante Schlottfeldt		Team Member		Program Assistant		GEEDR			

<b>Locations</b>					
<b>Country</b>	<b>First Administrative Division</b>	<b>Location</b>	<b>Planned</b>	<b>Actual</b>	<b>Comments</b>
Tanzania	Mara Region	Tarime District	X		
Tanzania	Tanga Region	Tanga Region	X		
Tanzania	Kilimanjaro Region	Same District	X		
Tanzania	Kilimanjaro Region	Rombo District	X		
Tanzania	Kagera	Ngara	X		
Tanzania	Rukwa Region	Mpanda District	X		
Tanzania	Morogoro Region	Morogoro Urban	X		
Tanzania	Mbeya Region	Mbozi District	X		
Tanzania	Mbeya Region	Mbeya Region	X		
Tanzania	Singida Region	Manyoni District	X		
Tanzania	Lindi	Mandawa	X		
Tanzania	Iringa Region	Makete District	X		
Tanzania	Kagera	Kyerwa	X		
Tanzania	Lindi	Kilwa Kisiwani	X		
Tanzania	Kilimanjaro Region	Kilimanjaro Region	X		
Tanzania	Kigoma	Kasulu	X		
Tanzania	Shinyanga Region	Kahama District	X		
Tanzania	Kigoma	Kagera	X		
Tanzania	Singida	Itigi	X		
Tanzania	Mwanza Region	Geita District	X		
Tanzania	Mbeya Region	Chunya District	X		
Tanzania	Mara	Butiama	X		
Tanzania	Shinyanga Region	Bukombe	X		
Tanzania	Kagera Region	Bukoba District	X		
Tanzania	Kagera Region	Biharamulo District	X		
Tanzania	Arusha	Arusha	X		
Tanzania	Ruvuma	Tunduru	X		
Tanzania	Lindi	Nachingwea	X		
Tanzania	Mtwara Region	Mtwara Region	X		
Tanzania	Ruvuma Region	Mbinga District	X		



<b>Institutional Data</b>				
<b>Parent ( Sustainable Management of Mineral Resources-P096302 )</b>				
<b>Practice Area (Lead)</b>				
Energy & Extractives				
<b>Cross Cutting Topics</b>				
[ ] Climate Change				
[ ] Fragile, Conflict & Violence				
[ x ] Gender				
[ x ] Jobs				
[ x ] Public Private Partnership				
<b>Sectors / Climate Change</b>				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Public Administration, Law, and Justice	Public administration-Energy and mining	74		
Energy and mining	Other Mining and Extractive Industries	26		
Total		100		
<b>Themes</b>				
Theme (Maximum 5 and total % must equal 100)				
Major theme	Theme	%		
Public sector governance	Other public sector governance	65		
Financial and private sector development	Micro, small and medium enterprise support	18		
Financial and private sector development	Other private sector development	11		
Public sector governance	Administrative and civil service reform	4		
Social dev/gender/inclusion	Participation and civic engagement	2		
Total		100		

<b>Additional Financing TZ Sustainable Management of Mineral Resources ( P151124 )</b>				
<b>Practice Area (Lead)</b>				
Energy & Extractives				
<b>Cross Cutting Topics</b>				
[ ] Climate Change				
[ ] Fragile, Conflict & Violence				
[x] Gender				
[x] Jobs				
[x] Public Private Partnership				
<b>Sectors / Climate Change</b>				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Energy and mining	Other Mining and Extractive Industries	74		
Public Administration, Law, and Justice	Public administration-Energy and mining	26		
Total		100		
<b>Themes</b>				
Theme (Maximum 5 and total % must equal 100)				
Major theme	Theme	%		
Public sector governance	Other public sector governance	65		
Financial and private sector development	Micro, small and medium enterprise support	18		
Financial and private sector development	Other private sector development	11		
Public sector governance	Administrative and civil service reform	4		
Social dev/gender/inclusion	Participation and civic engagement	2		
Total		100		
<b>Consultants (Will be disclosed in the Monthly Operational Summary)</b>				
Consultants Required? Consulting services to be determined				



## **I. INTRODUCTION**

1. This Project Paper seeks the approval of the Executive Directors to provide an additional credit in an amount of US\$45 million to the United Republic of Tanzania for the Sustainable Management of Mineral Resources Project (SMMRP) P151124, Credit No. 45840-TA. The Recipient will contribute an additional US\$5 million in parallel financing, bringing the total additional financing envelope to US\$50 million.

2. The SMMRP IDA Credit was approved by the Board on June 9, 2009 for a total amount of SDR 33.5 million (about US\$50 million equivalent). The project was launched on September 17, 2009 and became effective on September 22, 2009. The original credit received a one-year extension from June 30, 2014 to June 30, 2015 to complete key activities.

3. The original Project Development Objective (PDO) was “to strengthen the Government’s capacity to manage the mineral sector, to improve the socioeconomic impact of large-scale and small-scale mining for Tanzania and Tanzanians and enhance private local and foreign investments”. The Additional Financing retains the PDO of the original project but puts greater emphasis on the part which aims to “improve the socioeconomic impact of large-scale and small-scale mining for Tanzania and Tanzanians”. To that end, the project expects to expand activities in two of the original components: Component A - Improving the Benefits of the Mineral Sector for Tanzania (Artisanal and Small-Scale Mining, Local Economic Development Planning, and Skills Development); and Component B - Strengthening Governance and Transparency in Mining. No new activities are anticipated for Component C- Stimulating Mineral Sector Investment. The project retains the fourth project component (Component D) intended for Project Coordination, Management and Monitoring and Evaluation. The updated Result Framework is presented in Annex I.

4. SMMRP has satisfactorily made progress towards achieving the PDO, particularly in the last two years. Following remedial actions initiated in late 2012, implementation progress improved dramatically, with cumulative disbursements increasing from about US\$10 million at the end of 2012 to US\$46 million at the end of December 2014. The project has consistently maintained Moderately Satisfactory (MS) or Satisfactory (S) ratings for progress in implementation, in achieving Development Objectives, and in fiduciary management. Total cumulative disbursements have now reached 100 percent of the original project funds.

## **II. BACKGROUND AND CONTEXT**

5. The Government of Tanzania (GoT), under its National Strategy for Growth and Poverty Reduction (MKUKUTA), is committed to economic growth and reduction of poverty, improvement in the quality of life and social well-being and improved national governance and accountability to its current population and future generations. The country’s rich mineral endowment has long been considered a potential source of growth and poverty reduction. Accordingly, the World Bank has been supporting the government’s institutional and policy reforms in the mining sector over the past four decades. During the mid-1980s, the support focused on building the geological infrastructure required to identify and assess the mineral resources of the country. This was followed by a program in the early 1990s to promote the sector and attract mining Foreign Direct Investment (FDI) through policy and regulatory

reforms. Due in large part to the reforms supported by the World Bank since the 1980s, Tanzania has experienced strong, relatively steady FDI flows in mining, which in turn fueled a robust sector and macro-economic performance, with GDP growth anchored at an average of 7 percent per annum over the last two decades. Gold became the largest export of the country and has only recently been eclipsed by tourism because of the drop in the export value due to the dramatic fall of the prices of the metal. The original project, Sustainable Management of Mineral Resources Project (SMMRP), which became effective in 2009, has strengthened government capacity to manage the sector, improved the regulatory framework, expanded the country coverage by geological surveys and enhanced the social and environmental management framework for mining. The proposed Additional Financing builds on the achievements of SMMRP to support GoT's effort to transform mining-induced macroeconomic growth into broad-based socio-economic development and shared prosperity, particularly in rural areas.

6. The Tanzanian mining sector comprises two large subsectors. The first is the Large Scale Mining (LSM) subsector associated with large FDI, infrastructure development, technology transfer, high productivity and high export earnings. LSM tends to be highly capital intensive, and in the absence of strong backward, forward, and fiscal linkages with the rest of the economy, its contribution to job creation is very limited. The second sub-sector is known as Artisanal and Small-Scale Mining (ASM) and it often involves local miners using basic methods to extract near-surface deposits. ASM is associated with low investment, low productivity and the use of informal marketing channels, but it accounts for over 90 percent of the sector's employment and is more accessible to the poor, especially in rural areas. Most of the mining sector growth has come from formal LSM, which currently boasts five gold mines. However, because of the weak linkages between LSM and the local economy, particularly in rural areas, the socio-economic contribution has been sub-optimal. LSM-dominated mining currently contributes only a modest 3.5 percent to GDP, although this figure is expected to reach 10 percent by 2025 as new mines come on stream. Tanzanians, who are part of the working class, have increasingly turned to artisanal mining of small and medium-sized gold, copper, silver and other mineral deposits across the country as a mean of income generation. Indeed, people were first driven to ASM as an alternative livelihood during the economic decline following the demise of state control and ownership of productive sectors in the 1980s. Between 1987 and 1997 ASM accounted for almost the entire country's production of gold, copper and silver. This trend was reversed in the late 1990s with the massive inflows of FDI in large-scale mining. In 1998, Tanzania's economy became gradually dominated by LSM. Between 1999 and 2012 annual large-scale gold production grew from 0.13 million troy ounces to about 1.3 million troy ounces, making Tanzania one of the top gold producers in Africa. The biggest economic contribution of LSM during the period was in terms of export earnings and FDI. Until the economy diversified in the second half of the 2000s, LSM contributed over 40 percent to exports and accounted for 75 percent of FDI<sup>1</sup>.

---

<sup>1</sup> International Council on Metals and Mining: Tanzania Country Case Study – The Challenge of Mineral Wealth, July 2007

7. In recent years, legal and policy reforms oriented toward LSM resulted in significant improvements in the policy environment<sup>2</sup>. In response, annual gold production increased steadily, reaching 40 metric tons per year, with mining revenues quadrupling (from US\$102.1 million when SMMRP started in 2009 to US\$468.2 million in 2012), and mineral exports peaking at 44.8 percent of total exports in 2011. However, in spite of this productivity performance, the socio-economic benefits of LSM growth in terms of poverty reduction and shared prosperity have been, and continue to be, below expectations. In particular, the employment impact of large-scale mining has been quite modest in relative terms, despite an impressive growth in absolute terms (from 1,781 people in 1997 to 8803 people in 2012). Equally modest was the impact of mining on reduction of rural poverty which afflicts 83 percent of the estimated 13 million Tanzanians living below the poverty line. In 2001 when mining revenues began to flow, the rural poverty rate was about 39 percent, but by 2013 it had decreased by only five percentage points, settling at about 34 percent. During the same period, the total number of absolute poor remained at about 12 million people. This suboptimal poverty-reduction impact of large-scale mining has prompted the government to shift its approach from boosting the growth of the mining sector to that of improving its socio-economic outcomes for Tanzanians.

8. Parallel to the growth of LSM, small deposits gold, copper, silver, and other minerals became the focus of Tanzanian nationals, resulting in a vibrant ASM subsector. Indeed, between 1987 and 1997 ASM accounted for 95 percent of the country's mineral production, principally gold, copper and silver production. Currently, ASM accounts for roughly 10 percent of Tanzania's gold production, and is a major producer of gemstones, copper ore, iron ore, tin, bauxite, industrial minerals and building materials. ASM is typically labor intensive, operates within informal arrangements, and is associated with severe social, environmental, safety and security risks. ASM is spread across ten zones delineated by the government, and roughly half of this total ASM workforce can be found in two key gold belt areas: Lake and Central Western zones. Accordingly, to date the SMMRP has focused on a critical number of activities to support the government's ASM strategy in these areas. However over the past two years, new ASM areas have emerged in the South Western and Southern zones. The potential and challenges of ASM were recognized in the Mineral Sector Policy of 2009, and the government has since undertaken a number of initiatives to improve and rationalize the subsector, particularly in terms of regularization of the sector, and providing technical and financial assistance.

9. Tanzania joined the Extractive Industries Transparency Initiative (EITI) in February 2009 and became compliant in 2013. It has produced four EITI reports, covering the 2009-2012. The number of reporting companies has increased from 11 companies to 43 companies during the period. The 2012 report shows that 43 reporting extractive companies paid US\$469.6 million to the GoT in the form of taxes, royalties, and fees. Fiscal revenues derived from the sector have begun to reach their potential, following the end of the tax incentive periods granted to many of the first foreign investors in the late 1990s. Figure 1 below details annual Government revenues (taxes plus royalties) reaching US\$410 million in 2012, equivalent to 5.9 percent of the annual budget. Notwithstanding remarkable improvements in terms of tax contributions from the

---

<sup>2</sup> This is evidenced by an increase in the Tanzania's Frasier Institute policy perception index by over 10 points from 32.4 points in 2010 to 43.0 points in 2013).

sector—in the form of mining royalties, PAYE, withholding tax, etc.—perception remains that industrial mining in Tanzania has not sufficiently played a role in poverty-alleviation, particularly in the rural areas where mining occurs. Two commissions<sup>3</sup> led by government concluded with a new resolve to intensify efforts to leverage mining for development. Subsequently, the Revised Tanzania’s Mining Act was passed in 2010 with new provisions around local content, beneficiation, and increase participation of Tanzanian. The SMMRP has facilitated transforming these government priorities as set forth in new policy and legislation, into practical applications in key mining areas.

### **III. RATIONALE FOR ADDITIONAL FINANCING**

10. In order to improve the socio-economic benefits of mining, the Government has adopted a two-prong approach: (i) improving the linkages of LSM with local communities through better integration of corporate social responsibility programs and local development planning in mine-affected areas; and (ii) encouraging the formalization and sustainable development of ASM as a means of boosting local entrepreneurship and employment in mining.

11. The LSM approach focuses on establishing linkages between large-scale mining operations and the local economy to enable local and regional economies to take advantage of mining investment as a catalyst for broader development. It has already been tested in three pilots around large scale mines and has resulted in mainstreaming LSM benefits in local Government strategies and budget planning. The ASM approach emphasizes formalization as a solution to the technical, social, and environmental problems which prevent the subsector from achieving its socio-economic potential. In 2013, the Government established a small-scale mining finance facility of 8.1 billion Tanzanian shillings as a financial incentive to Tanzanians nationals operating as informal miners who are willing to register and formalize their activities with a Primary Mining License (PML) available in areas set aside exclusively for ASM operations. Formal involvement by Tanzanian nationals through PML holding is now considered by GoT to be an effective alternative for spreading the economic and social benefits of mining to a wider segment of the population.

12. Currently, ASM contributes roughly 10 percent of Tanzania’s gold production but accounts for a much higher share of employment (over 90 percent of the gold industry’s total). It is also a significant source of gemstones, copper ore, iron ore, tin, bauxite, industrial minerals and building materials. Figures provided by the MEM indicate that around 700,000 people are officially working in the sector, but an estimated 1 million people are believed to be involved in this activity, including women and children, along the supply chain. Typically, ASM generates four jobs for every person involved. However, it often operates outside formal channels and is associated with severe social, environmental, safety and security risks. In its Mineral Sector

---

<sup>3</sup> Mineral Policy Review Committee (Kipokola Report) in 2004; this was succeeded by a Presidential Commission on the Mineral Sector in 2008 (Bomani Report). These in-depth reviews of the mineral sector aimed to identify improvements in sector capacity to stimulate additional economic growth. The recommendations from the Kipokola and Bomani reports provided inputs into the Government’s current policy reform process. Both reports emphasized the urgent need to build capacity within government institutions and agencies so as to (a) enable sustainable development of a modern, market driven sector, with adequate benefits for the country; (b) establish a modern, transparent administrative and oversight set-up for the sector; (c) consolidate the mineral sector growth achieved since the late 1990s; and (d) continue developing basic geo-information to sustain investment promotion.

Policy Statement of 2009, the GoT set explicit goals for increased involvement of Tanzanian nationals in the mining sector. The specific objectives aimed at boosting the socio-economic benefits of mining for Tanzania and Tanzanians included: (i) establishing an enabling environment for Tanzanians to participate in ownership of medium and large scale mines; (ii) supporting and promoting development of small scale mining so as to increase its contribution to the economy; (iii) facilitating, supporting and promoting increased participation of Tanzanians in gemstone mining; (iv) establishing transparent and adequate land compensation, relocation and re-settlement schemes in mining operations; (v) strengthening involvement and participation of local communities in mining projects and encouraging mining companies to increase corporate social responsibilities; (vi) promoting and developing a marketing system of minerals to ensure that miners get the right price for minerals traded in formal markets; and (vii) promoting and facilitating value addition activities within the country to increase income and employment opportunities. Most of these policy objectives were supported under SMMRP and some pilot initiatives have produced promising results which justify taking them to scale.<sup>4</sup>

11. ASM is spread across ten zones in special areas delineated and set aside by the government for the orderly development of the activity. To date the SMMRP project has focused on a critical number of activities to support the government's ASM strategy in these areas. However, over the past two years, new ASM areas have emerged in the South Western and Southern zones. Over the course of the last decade, the government has actively encouraged formalization of artisanal and small scale mining by simplifying procedures for acquiring PMLs; decentralizing the MEM licensing, inspections and extension services functions to Zonal Mines Offices (ZMO) and Resident Mines Office (RMO) and providing financial assistance to artisanal miners willing to formalize their operations. As a result of these efforts, the number of PMLs has risen dramatically, increasing from about 35 in 1999 to nearly 26,000 at the end of 2013. By the end of 2014, this number has further increased to 35,000. The rapid growth of the number of miners accepting to formalize (i.e., register a PML and operate under the provisions of the Mining Act of 2010), as shown in Figure 1, indicates that ASM could become an important formal economic activity in rural areas. This has led the government to prioritize the activity and commit its own budgetary resources to provide technical and financial incentives for the orderly development of ASM. As explained in the detailed project description (Annex II), the rationale for Additional Financing in order to scale up the LSM linkages and the ASM-related activities of the original project relates to the positive response to the formalization agenda supported by SMMRP, as evidenced by the steep rise of the number of registered ASM operators (PML holders in good standing), the increase in tax payments from the sector, and the growing demand for technical and financial support from operators looking to modernize existing operations or regularize informal ones. The proposed support responds to the GoT's policy priority to develop small and medium size deposits of precious and semi-precious metals, base metals, ferrous metals, and industrial minerals, gemstones (including diamonds and tanzanite) and semi-precious minerals as a means of achieving the Millennium Development Goals and reducing rural poverty. The

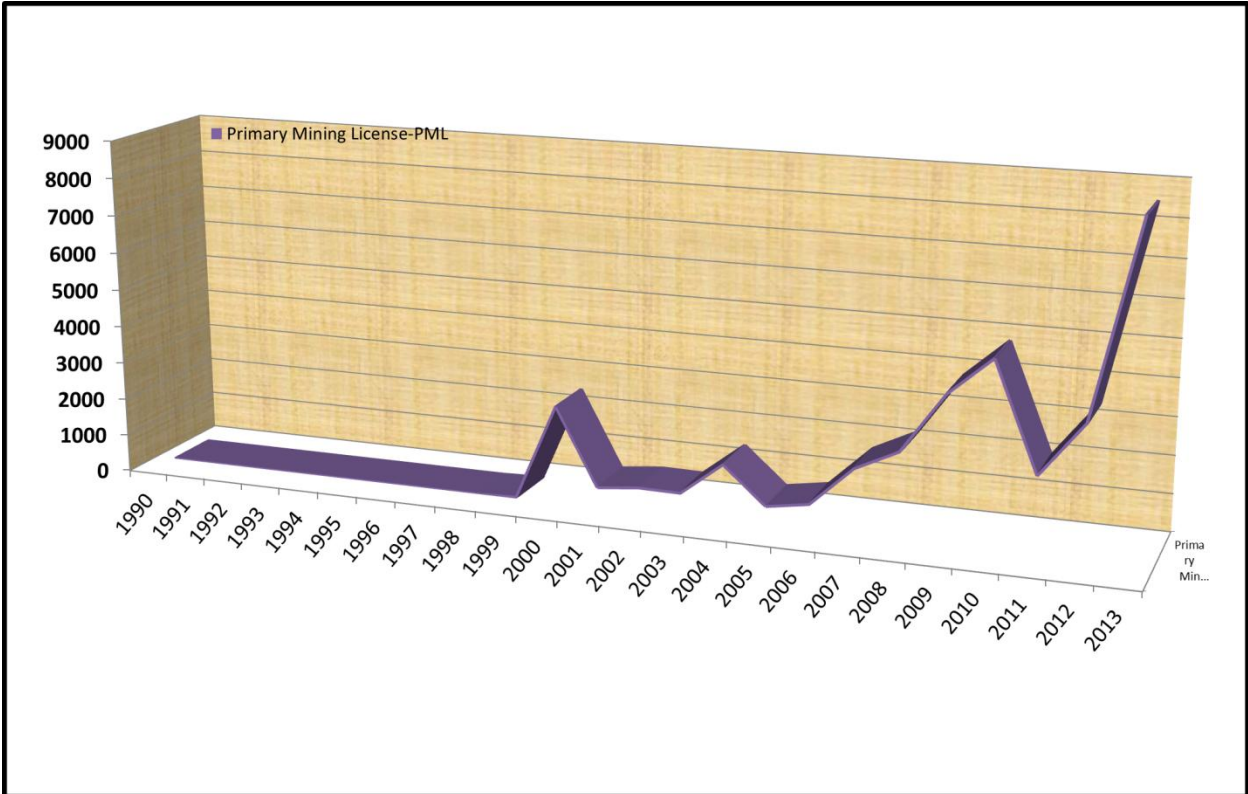
---

<sup>4</sup> Pilots supported under SMMRP I included a Small Grants Program for ASM which became quickly oversubscribed; a Multi-stakeholder Partnership initiative on ASM which has brought government, mining companies, ASM associations, and village communities to work together to achieve sustainable outcomes for ASM and reduce ASM-LSM conflicts; and the mainstreaming of mining into local government budget processes which resulted in strategic plans and budgets for the provision of social services to ASM communities in three districts.



support will also address the need for improving the ASM subsector’s technical, environmental and social performance and mitigating the risk of land-use conflicts between ASM and LSM.

Figure 1: ASM licensing trends (number of licenses issues per year 1990 to 2013)



Source: Ministry of Energy and Minerals

12. Tanzania can draw on lessons from the legal and institutional reforms undertaken in Chile and Ghana to develop its ASM subsector into a national, private-led, economically viable and environmentally sustainable small and medium mining subsector (see Annex III on the experience of Chile and Ghana). For example, over the years, Chile has eliminated the need for unregulated artisanal mining, developed a vibrant domestic small and medium mining sector and in the past three decades, transitioned to the status of world mining superpower. The case of ASM reform in Ghana also shows that the government implemented the right policies to stimulate growth in the ASM subsector. However, in recent years, implementation weaknesses in Ghana slowed the momentum of the formalization agenda and resulted in land-use conflicts. The lesson for Tanzania is that the success of the formalization agenda rests on the availability of geological ground suitable for ASM, the demarcation of exclusive areas for ASM, and the simplification of licensing procedures. The ASM baseline survey conducted in 2014 to inform

the design of the AF also highlighted the deficiency of geological data as a key impediment for the orderly growth of ASM. The lack of reliable data in existing ASM site areas also impacts negatively on the long term sustainability of individual operations. Insufficient geological data traps small-scale operators in cycles of undercapitalization which lead to minimal investment in mining operations while encouraging short-term ‘mining rush’ scenarios. By advancing the formalization agenda of ASM and reinforcing the monitoring capacity of MEM, the AF will improve social and environmental performance with a focus on specific aspects of mining regulations inspections dealing with child labor and mercury contamination.

#### IV. PROPOSED CHANGES

<b>Summary of Proposed Changes</b>	
The PDO of the original project was to strengthen the Government’s capacity to manage the mineral sector, to improve the socioeconomic impacts of large and small-scale mining for Tanzania and Tanzanians, and enhance private local and foreign investments. The proposed Additional Financing retains the same objectives, but significantly scales up the second aspect of the project development objective which aims to “improve socio-economic impacts of large and small-scale mining for Tanzania and Tanzanians”. The scaling up would address the following challenges: difficulty in identifying suitable geological environment for artisanal miners, inadequate training and demonstration centers for ASM and lack of knowledge in value addition (faceting, carving and jewelry), marketing and financial access.	
Change in Implementing Agency	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Project's Development Objectives	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Results Framework	Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]
Change in Safeguard Policies Triggered	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change of EA category	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Other Changes to Safeguards	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Legal Covenants	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Loan Closing Date(s)	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Cancellations Proposed	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Disbursement Arrangements	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Reallocation between Disbursement Categories	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change in Disbursement Estimates	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]
Change to Components and Cost	Yes [ <input checked="" type="checkbox"/> ] No [ <input type="checkbox"/> ]
Change in Institutional Arrangements	Yes [ <input type="checkbox"/> ] No [ <input checked="" type="checkbox"/> ]

Change in Financial Management	Yes [ ] No [ X ]
Change in Procurement	Yes [ X ] No [ ]
Change in Implementation Schedule	Yes [ ] No [ X ]
Other Change(s)	Yes [ ] No [ X ]

--

<b>Development Objective/Results</b>
--------------------------------------

<b>Project's Development Objectives</b>
---

<p>Original PDO</p> <p>To strengthen the Government's capacity to manage the mineral sector, to improve the socioeconomic impacts of large and small-scale mining for Tanzania and Tanzanians, and enhance private local and foreign investments.</p>
---

<b>Change in Results Framework</b>
------------------------------------

<p>Explanation:</p> <p>The results framework has been updated to increase some target values and to add new indicators, which will measure the scaled up activities. The revised Result Framework is presented in Annex I.</p>
--

<b>Compliance</b>
-------------------

<b>Covenants - Additional Financing ( TZ Sustainable Management of Mineral Resources - P151124 )</b>
--

Source of Funds	Finance Agreement Reference	Description of Covenants	Date Due	Recurrent	Frequency	Action
IDA	Institutional arrangements	(a) Without limitation on the provisions of Section I.A of this Schedule, by no later than December 31st 2015, the Recipient, through MEM, shall enter into a memorandum of understanding, in each case in form and substance satisfactory to the Association,	31-Dec-2015	<input type="checkbox"/>		New

		with: (i) STAMICO for the implementation of activities related to the carrying out of demonstration activities under Part A.1 of the Project;				
IDA	Institutional arrangements	(a) Without limitation on the provisions of Section I.A of this Schedule, by no later than December 31st 2015, the Recipient, through MEM, shall enter into a memorandum of understanding, in each case in form and substance satisfactory to the Association, with: (ii) Tanzanian Investment Bank, for the administration of Grants under Part A.3 of the Project.	31-Dec-2015	<input type="checkbox"/>		New
IDA	"Mine Closure Policies and Regulations" and Environmental Protection Plan	(a) By no later than June 30, 2016, carry out the review of the Mine Closure Policies and Regulations referred to in Part B.1(a) of the	31-Dec-2017	<input type="checkbox"/>		New

		Project in a manner satisfactory to the Association, and (b) by no later than December 31, 2017, or another date as may be agreed to with the Association, prepare and furnish to the Association, for its review and comment, a draft of the updated policies				
IDA	Environmental and Social Safeguards	The Recipient shall, by no later than six (6) months after the Effective Date:(a) carry out an environmental audit of the works undertaken under the Original Project, under terms of reference and in a manner satisfactory to the Association; and (b) prepare and furnish to the Association a report, in form and substance satisfactory to the Association, on the findings of the said environmental	31-Mar-2016	<input type="checkbox"/>		New

		audit.				
IDA	"Mine Closure Policies and Regulations" and Environmental Protection Plan	By no later than June 30, 2016, prepare and furnish to the Association, for its review and comment, a draft of the Environmental Protection Plan referred to in Part B.1(a) of the Project, and afford the Association a reasonable opportunity to exchange views with the Recipient on such draft Plan, and thereafter ensure that the said Plan is finalized and adopted, taking into account the comments	30-Jun-2016	<input type="checkbox"/>		New

<b>Risk</b>	
<b>Risk Category</b>	<b>Rating (H, S, M, L)</b>
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Low
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environment and Social	Moderate
8. Stakeholders	Low
9. Other	Low

OVERALL		Substantial		
<b>Finance</b>				
<b>Loan Closing Date - Additional Financing ( TZ Sustainable Management of Mineral Resources – P151124 )</b>				
<b>Source of Funds</b>		<b>Proposed Additional Financing Loan Closing Date</b>		
IDA Credit		31-Dec-2018		
<b>Allocations - Additional Financing ( TZ Sustainable Management of Mineral Resources - P151124 )</b>				
Source of Fund	Currency	Category of Expenditure	Allocation	Disbursement %(Type Total)
			Proposed	Proposed
IDA	XDR		32,700,000.00	100.00
		<b>Total:</b>	32,700,000.00	
<b>Components</b>				
<b>Change to Components and Cost</b>				
Explanation:				
<p>The AF will have three components, compared to the original project, which had four components. The component on stimulating mining investment in the original project (old Component C) was fully completed. For this reason, it was not considered for scale up under the Additional Financing.</p> <p>Based on extensive consultations with the Government complemented by regular sites visits and engagement with a broad range of stakeholders, the following components and activities are proposed for the AF. The components and activities are described below.</p> <p><b>Component A (US\$33.7 million): Improving the Benefits of the Mineral Sector for Tanzania: Artisanal and Small-Scale Mining, Local Economic Development and Skills Development</b></p> <p><i>Sub-Component A.1: Centers of Excellence (US\$22.7 Million)</i></p> <p>Over the past decade, GoT has made significant progress in formalizing artisanal mining. However, although the rate of formalization has been growing, the sector still relies on crude, manual methods and informal production structures. A typical formalized artisanal mining operation comprises a registered PML holder, a few pit holders, a number of workers, and specialized service providers. The PML holder, who is considered the owner of the license, often sub-leases his mineral rights to pit holders who then hire artisanal miners to carry out the mining activity. The remuneration system is based on a production-sharing model whereby the PML</p>				

holders takes 30 to 50 percent of the ore and the balance is used to defray the costs of production and reward the pit owner. Specialized workers sometimes process the gold. Within the vicinity of each site, there are specialized fee-based services. These include ore transportation, crushing and grinding, as well as gold recovery by way of amalgamation with mercury.

The challenge in the transformation of ASM is to move beyond “paper formalization” and tap the entrepreneurial potential of career small-scale miners to encourage the establishment of formal ASM businesses which could provide formal employment opportunities to those miners who are not entrepreneurs or could not otherwise meet the requirements for acquiring a PML. The Centers of Excellence (COE) respond to this challenge by offering technical, financial, and managerial support to PML holders seeking to move from artisanal mining towards small and even medium-scale mining, so as to become viable small-scale and medium-scale privately-owned Tanzanian mining enterprises. The centers focus on existing, established small-scale mines or on prospecting licenses that were relinquished by large mining companies. Years ago, many of these sites started spontaneously and became “gold rush” areas attracting hundreds or thousands of transient miners.

This sub-component combines classroom training in existing ZMO with on-site demonstration activities in established mines owned by the State Mining Corporation (STAMICO). It focuses on:

- a) Establishment of mining centers of excellence in the Selected Zonal Mining Offices including through: (i) the extension of existing office facilities to create classrooms, conference rooms, information centers, and workshops; (ii) the acquisition of demonstration materials including, inter alia, portable processing units, retorts, safety gear, and equipment for rock sample analysis, (iii) the preparation and dissemination of training manuals; (iv) the provision of training; and
- b) Upgrading of processing technology and carrying out of demonstration activities to model environmentally sound processing techniques at selected mines in Buhemba (Musoma), Mbesa (Tunduru), Itumbi (Chunya), Lwamgasa (Geita), Kyerwa (Bukoba), Katente (Kahama), Mishindo (Nachingwea), and Kaparamsenga (Mpanda).

The COEs will bring together the services of the following government agencies:

- *ZMO*: as the licensing authority for PML, ZMO will host and manage the training and capacity building centers for the transformation of artisanal mining. They will provide extension services, conduct knowledge exchange, disseminate information on best practices and appropriate technologies, and ensure compliance with laws and regulations, particularly with respect to health, safety, child labor, mercury emission, and environmental protection.
- *Geological Survey of Tanzania (GST)*: the role of GST will be to conduct geological ground works and field verifications to identify mineralization structures that may be suitable for ASM, to delineate these structures and coordinate with appropriate local and central authorities (District Government, Ministry of Land, Ministry of Mines) to designate exclusive areas for ASM. GST will also provide, on a cost recovery basis, detailed exploration and geological modeling to PML holders who wish to estimate minable



reserves and develop long-term mine development plans.

- *STAMICO*: the role of STAMICO will be to provide, on a cost recovery basis, geological and mining advisory services to PML holders and to manage the demonstrating sites, as part of the umbrella COE structure. In view of the high capital and operating costs of the demonstrating sites, STAMICO will use them both for demonstration of environmentally sound processing technologies, and for toll processing of ores produced by artisanal miners, using mercury-free processes.
- *Tanzania Investment Bank (TIB)*: TIB will provide financial services and dispense grants to PML holders.
- *Manufacturers' Associations*: two organizations will be involved in the COEs to help adapt appropriate technologies to the ASM sector. These include the Vocational Education and Training Authority for design and blue prints, and the Small Industries Development Organization for the actual manufacturing.

Annex II describes in detail the planned activities of a typical COE. All activities will be within the footprint of the existing ZMOs in the urban areas, or mines established already and run by STAMICO under a Memorandum of Understanding with the Ministry of Energy and Minerals. No new land is needed for the activities under this component as a result.

#### *Sub-Component A.2: Geological Ground Works (US\$ 5.4 million)*

This sub-component supports targeted geological ground works in the Selected Mining Zones to generate geological information to improve mine development; sampling and testing of mineral resources; and provision of related training to primary mining license holders in basic data interpretation.

The GST will perform works under this subcomponent; and the GST will work directly on sampling and mapping in this target area, and on providing the PML holders with basic training on data interpretation. Areas targeted correspond with the seven mining zones under Component A.1.

#### *Sub-Component A.3: Small Grants to Small-Scale Miners (US\$3.4 million)*

The AF will scale up the current Small Grants Program, extending geographic eligibility to all seven zones mentioned in Component A.1. TIB will continue to manage the Program under a Memorandum of Understanding with the Ministry of Energy and Minerals.

This subcomponent supports the expansion to the Selected Mining Zones of a program to provide Grants to support small-scale miners and Community-based Mining Organizations, in support of activities related to, inter alia, expansion of production, improving mineral recovery, value addition, and business and skills development.

The Small Grants Program (SGP) aims to provide rapid, short-term funding to small scale miners who are registered individuals, cooperatives, association, partnership and companies. The SGP

funding focuses on increasing performance of ASM activities directly or indirectly through improved mining practices, value addition, and subsidiary business service development. The SGP intends to increase incomes and empowerment of small mine operators to further professionalize their operations and turned them into an economically, environmentally and socially sustainable entrepreneurial activity.

*Sub-Component A.4: Value Addition (US\$1.4 million)*

This sub-component focuses on strengthening the capacity of the Tanzania Gemological Center (TGC) to function as a regional hub for training and marketing of gemstones, including through: (a) provision of training and support for the citizens in value addition and investment in the gemstone sector; (b) piloting of initiatives for fair trade in Artisanal and Small-scale Mining products; (c) provision of support for the Tanzania International Gem Show; and (d) provision of support to TGC in building strategic partnerships for capacity building and marketing with international training and marketing centers.

*Sub-Component A.5: Integrating Mining Community Development Priorities into Local Government Planning (US\$ 0.8 million)*

This sub-component emphasizes provision of support for the improvement of linkages in the selected Mining Zones between mining and the local economy through support to selected Local Government Authorities (LGA), inter alia for: (a) assessing budgetary structures and mainstreaming mining into strategic planning at the District level; (b) developing policies and procedures for local government provision of social services to Artisanal and Small-scale Mining areas; (c) developing and delivering of alternative livelihood skills training; and (d) assessment of local content opportunities and preparation of local procurement strategies aimed at enabling entrepreneurs to provide goods and services to large and medium scale mines.

**Component B (US\$5 million): Strengthening Governance and Transparency in Mining**

This component builds on the legal and regulatory reforms of the original project and the EITI to address gaps in sector regulations, strengthen monitoring capacity, and improve ASM revenue transparency. It has two subcomponents:

*Sub-Component B.1 (US\$3.0 million): addressing regulatory gaps*

This sub-component focuses on carrying out of a program of activities aimed at addressing gaps in the Recipient's regulatory framework, including through: (a) carrying out a review and updating of MEM's Mine Closure Policies and Regulations and finalization of the environmental protection plan for Artisanal and Small-scale Mining; (b) integration of data on the Recipient's online licensing system platform; (c) strengthening of mine inspection procedures; (d) provision of technical assistance to support the preparation of an update of the Recipient's regulatory framework for the storage and handling of explosives use with respect to small-scale mining and related health and safety protocols; and (e) provision of technical assistance to support the preparation of implementation regulations for the Recipient's regulatory framework for value addition.

*Sub-Component B 2 (US\$2.0 million): Improving transparency*

This sub-component aims to reinforce transparency initiatives aimed at improving sector governance, including through: (a) supporting the Tanzania Mineral Audit Agency and the Tanzania Revenue Authority in integrating Artisanal and Small-scale Mining into the tax revenue collection model; (b) supporting the EITI Secretariat in conducting a value chain audit of Artisanal and Small-scale Mining; (c) integration of Artisanal and Small-scale Mining data with existing data sources from the EITI process, Tanzania Revenue Authority, and Tanzania Mineral Audit Agency; (d) carrying out of a national survey of Artisanal and Small-scale Mining to inform the government's Artisanal and Small-scale Mining support strategy; and (e) establishment of a mine inspection tracking and management system.

**Component C (US\$5.0 million): Project Coordination**

The objective of this component is to strengthen the capacity of MEM for coordination and management of the Project including supporting the enhancement of, inter alia: (1) day to day management of the Project; (2) procurement; (3) monitoring and evaluation; and (4) coordination of Project exit studies to evaluate the overall performance of the Project, and achievement of the Project's objective, through the provision of technical advisory services and Training.

The Government of Tanzania will provide US\$5.0 million of parallel financing, including 3.8 million under Component A, US\$0.9 million under Component B, and US\$0.3 million under Component C. The revised cost structure of the project is presented below.

<b>Current Component Name</b>	<b>Proposed Component Name</b>	<b>Current Cost (US\$M)</b>	<b>Proposed Cost (US\$M)</b>	<b>Action</b>
A. Improving the Benefits of the Mineral Sector for Tanzania: Artisanal and Small-scale Mining, and Local Economic Development,	A. Improving the Benefits of the Mineral Sector for Tanzania: Artisanal and Small-Scale Mining, Local Economic Development and Skills Development	15.90	53.40	Revised
B. Strengthening Governance and Transparency in Mining	B. Strengthening Governance and Transparency in Mining	8.70	14.60	Revised
C. Stimulating Mineral Sector Investment	C. Stimulating Mineral Sector Investment	25.00	25.00	No Change
D. Project Coordination and Management	D. Project Coordination and Management	2.50	6.90	Revised

	Physical and price contingencies	0.00	2.30	New
	PPF refinancing	0.00	0.00	Revised
	<b>Total:</b>	52.10	102.20	

--	--	--	--	--

<b>Other Change(s)</b>
------------------------

<b>Change in Procurement and Financial Management</b>
---

Explanation:

**Procurement:**

Procurement under the Project will involve procurement of goods, works, and consultancy services. Procurement will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised July 2014; and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised July 2014; Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and revised in January 2011; and the provisions stipulated in the Legal Agreement. National Competitive Bidding for goods and works shall be subject to the following: (a) In accordance with para.1.16(e) of the Procurement Guidelines, each bidding document and contract financed out of the proceeds of the Financing shall provide that: (i) the bidders, suppliers, contractors, and subcontractors shall permit the Association, at its request, to inspect their accounts and records relating to bid submission and performance of the contract and to have said accounts and records audited by auditors appointed by the Association; and (ii) the deliberate and material violation by the bidder, supplier, contractor, or subcontractor of such provision may amount to an obstructive practice as defined in paragraph 1.16 (a)(v) of the Procurement Guidelines; and (b) there shall be no preference accorded to the domestic suppliers and contractors.

The procurement capacity that exists for the original project will remain for the Additional Financing. However, the capacity assessment recommends strengthening of the Procurement Management Unit and User Departments in contract management.

The Procurement Plan will provide details for each contract to be financed under the Additional Financing, the various procurement or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time-frame. It will be updated at least annually or as required to reflect actual project implementation needs and improvements in

institutional capacity. The Project Management Team will prepare a General Procurement Notice (GPN), describing the goods, works, consultancies and non-consultancy services to be procured. The GPN will be published in the United Nations Development Business and in local newspapers.

Thresholds for procurement method and prior review: the Procurement Plan shall set forth those contracts which shall be subject to the Bank's Prior Review. All terms of reference for consultants services, regardless of contract value, shall also be subject to the Bank's prior review.

### **Financial Management**

Financial management and disbursement arrangements currently in place under the original project are satisfactory. These will be applied to the Additional Financing and no changes are envisaged. The project's financial management systems are sound and comply with generally accepted accounting principles. The systems provide reasonable assurance that the project funds will be used for the intended purposes.

## **Appraisal Summary**

### **Economic and Financial Analysis**

#### **Explanation:**

Overall economic analysis remains valid from the original project. Additional assumptions and updates are as follows:

According to the World Bank's 6<sup>th</sup> Economic Update for Tanzania, short and medium term prospects remain positive for the Tanzanian economy. GDP growth is forecasted to remain in the range of seven percent. Poverty reduction—already having decreased from 34 to 28 percent between 2007 and 2012—is anticipated to continue. On-going improvements to the economy, including the positive visible trend in pro-poor growth, are in part attributable to mining. It is anticipated that even with decline in the price of gold, Tanzania will continue to benefit from mineral exports for growth purposes.

With respect to the various components of the Additional Financing, a number of benefits are expected for the Government and citizens of Tanzania. There are two key areas of fiscal benefit: (i) an increase in revenues from formalized small-scale mining operations; and (ii) an increase in household income from improved small-scale mining practices. For instance, extension services and the model mines for artisanal and small-scale miners are expected to increase production and income of miners by an average of 35 percent (real increase) and will benefit 100,000 and possibly 150,000 miners. These figures translate into at least US\$29 million per year at an estimated current daily income of US\$16 per day per miner. License fees and royalty collection from mining are expected to increase (conservatively) by 8 percent over the life of the Project. Based on Tanzania's current mining revenue (US\$50 million), it is expected that the Project would contribute to an increase in revenue of about US\$2.5 million per year under the Additional Financing period and beyond. It will be possible to quantify the economic benefits from improved practices through the revised Results Framework which will monitor production increases at mine sites benefiting from technical inputs and revenue collection increases from government agents.

The GoT will conduct an impact evaluation at the end of the project.

A secondary effect of better-performing small-scale mining operations would be the creation of jobs and small businesses who service the mining areas. The Project will be in a position to track employment generation at the mines benefiting from Additional Financing. Though such knock-on effects to subsidiary business development (and therefore indirect employment) are not as easily monitored by the Project, the average ratio of 1:4 in Tanzania<sup>5</sup> is proposed: that is, for every one job created in a small-scale mine, four are created in the surrounding area to service the operation.

Beyond economic benefits, the Additional Financing will improve the manner in which small-scale mining is undertaken in Tanzania, with respect to environmental and social regulation. As described in the above sections, the original project focused on ensuring development of a regulatory framework for small-scale mining to occur responsibly and legally. The Additional Financing now focuses on ensuring that monitoring and inspection functions of the Ministry are fulfilled, alongside compliance by operators themselves. The conceptual cost-benefit analysis and the assessment of the socio-economic returns of support to artisanal mining operations and to a semi-mechanized small-scale mine, presented in Annex IV show that support to formalization can improve the incomes of miners and stimulate growth in the local (rural) economy through backward and forward linkages.

### **Technical Analysis**

#### **Explanation:**

The Additional Financing has been prepared with the cooperation of mining technical experts in the MEM and the World Bank. Building on the strong learning from pilots in the current Project, the evolution in the country's active mining areas, and considering where certain technical areas received less support in the original implementation compared to its multiplying development impact, the Additional Financing seeks to further strengthen benefits to Tanzanians in the sector. In order to do so, the Additional Financing seeks to further ensure that government, particularly the MEM staff in the ZMO and RMO alongside the local government, can effectively regulate the sector, hence increasing benefit impact possibilities.

The technical soundness of the Additional Financing activities is further enhanced by: (i) valuable lessons learned from the implementation of the original project; (ii) lessons from ASM reforms around the world; (iii) better implementation capacity with an experienced project management team; and (iv) use of strong technical partners to assist with implementation, including outsourcing of services to TIB, GST, and STAMICO.

The benchmark standard for technical skills is international good practice, but with emphasis on appropriate technology in the area of artisanal and small-scale mining and local value added activities, such as jewelry manufacturing.

### **Social Analysis**

<sup>5</sup> The Extractive Resource Industries in Tanzania: Society for International Development, 2009  
[http://www.sidint.net/sites/www.sidint.net/files/docs/extractive\\_resource\\_industry.pdf](http://www.sidint.net/sites/www.sidint.net/files/docs/extractive_resource_industry.pdf)

Explanation:

The project has prepared an Environmental and Social Management Framework (ESMF) which provides due diligence measures and mechanisms to ensure that all potential environmental and social impacts are well identified and addressed. The ESMF has been updated with the following additions: (i) inclusion of the recommendations of the Strategic Environmental and Social Assessment (SESA) delivered under the original project; (ii) guidelines for minor civil works; (iii) occupational and safety measures to be instituted; (iv) precautions for mercury usage among ASGM or use of recommended alternative technologies; (v) a defined coordination mechanism with other departments; (vi) a budget for the implementation of the ESMF (including enforcement, monitoring and reviews); and, (vii) modalities or the usage of the Environmental and Social Impact Statement (ESIS). The revised ESMF was prepared in consultation with stakeholders at the national and local levels including government ministries/agencies, mining companies, other private sector actors, artisanal miners, NGOs and communities affected by mining operations.

Recommendations from the SESA, produced under the parent project, have been taken into consideration when designing activities to be financed under the additional financing, namely: finance, institutional structures, community development, forward planning, awareness and skills raising training, and monitoring and enforcement. For both civil works and small grants the Borrower will monitor for potential environmental impacts from these activities using the revised ESMF.

The SESA also recognized that child labor in ASM is still an issue propagated by poverty but also by the itinerant tendency of parents who shift with children from community to community, and often to mineral rushes. Some children also engage in ASM after being abandoned by parents or guardians. The Project will introduce an ASM inspection checklist which emphasizes enforcement of the provision of Article 15 of the Mining (Environmental Protection for Small-Scale Mining) Regulations of 2010 which prohibit child labor in mining. The Results Framework will include an indicator for tracking reduction of child labor by 75% from the level of the ASM baseline study in the original project which estimated child labor prevalence in mine sites at 1.8%.

Women are very active in mining in Tanzania, and there is a dynamic association of women miners and processors. It includes the Tanzania Women Miners Association with about 350 active members engaged in small scale mining of gemstones, gold, diamonds, and industrial minerals in Tanga, Morogoro, Dodoma, Singida, Shinyanga, Mbeya, Manyara, Arusha, Ruvuma, Lindi, Musoma, Karagwe, and Mwanza, and the Tanzanian chapter of The African Women in Mining Network which focuses on small programs that improve the livelihoods of women involved in the mining sector in Tanzania. The SESA has identified access to finance as a major barrier to greater women's involvement in mining, because of inheritance and customary marriage laws, which preclude them from having rights to land as collateral for bank loans. The project will target the women's association for its capacity building. The Small Grants Program sets a 30% target for women-owned or operated mining and processing businesses.

The Project has also updated the Resettlement Policy Framework (RPF), though it does not trigger OP 4.12. The original Project had developed an RPF to mitigate potential negative impacts from

the geological airborne survey work to be conducted near protected forest areas. Given that the targets areas are in existing artisanal mine footprint areas, Resettlement Action Plans (RAP) were not developed. However, involuntary resettlements are not anticipated under the Project's Additional Financing. The limited civil work for the expansion of the zonal offices will be done within the existing footprint of the zonal centers. The targeted geological ground works in ASM areas are on government lands that are unoccupied. However should the possibility of resettlement arise during implementation and as a result of the Project's activities, the Client has prepared a Resettlement Policy Framework, which will be the basis for any site specific RAP if needed.

### **Environmental Analysis**

#### **Explanation:**

The Project is rated as Category B. It consists of technical assistance activities and does not involve direct investment in mining activities. However, it could have indirect environmental and social impacts arising from some activities related to minor civil works and mining and mineral processing by ASM. The project's Environmental and Social Management Framework provides mechanisms to ensure that all environmental impacts that may result from Additional Financing are identified, assessed and mitigated appropriately.

The project will have a small environmental footprint predominantly in the ASM areas and safeguards issues are addressed through the activities proposed under the AF for enhancing the social and environmental sustainability of ASM. The project will support the National Strategic Plan for Mercury Management developed in 2009 and which endeavored to introduce mercury-free technologies for gold processing. Mercury emissions from the ASM sector in Tanzania and other parts of the world remain a global concern. In January 2013 a global meeting in Japan led to the legally binding Minamata Convention on Mercury, which aims to reduce global mercury pollution. Tanzania became a signatory to the Convention on October 10, 2013, and is legally obligated under Article 7 and Annex C of the Convention to endeavor to develop and implement a national plan for mercury abatement in ASM. The project will contribute to this effort by supporting the establishment of demonstration centers for mercury-free gold processing and the introduction of mercury abatement technologies adapted to local needs.

No new construction will be conducted, but minor civil works (for renovation or upgrading of existing facilities) are to be funded under the AF. The Recipient will perform an environmental audit within the next year on works undertaken under the original credit.

For both civil works and small grants the Recipient will monitor for potential environmental impacts from these activities and revised EMF.

The ESMF provides that sub-projects will be assessed by the Beneficiary and assigned an appropriate environmental classification (A, B or C) based on World Bank Operational Policy (OP 4.01) depending on the type, location, sensitivity and scale of the project and the nature and the



magnitude of its potential environmental and social impact. The categories are:

- A) Any project which is likely to have significant adverse environmental and social impacts that are sensitive, diverse or unprecedented. The impacts under this category affect broader areas than the sites or facilities subjected to physical works.
- B) Any project which is likely to have significant adverse impacts on human populations or environmentally important areas including wetlands, forests, grasslands and any other natural habitat. Generally they are less adverse than those of category A projects, the impacts are site specific and few or any of them are irreversible and most of them are mitigated more rapidly than category A.
- C) Any project which is likely to have minimal or any adverse environmental and social impact. Beyond screening no further environmental assessment action is required.

An appropriate environmental and social management and monitoring plan will be used, based on the scope of the identified major impacts to be addressed in the implementation of the project. Under the guidance of the Environmental Management Officers of the LGA, the Environmental Management Committee at the local government level will review the environmental and social screening results as well as the environmental checklists that were completed in the course of project preparation to ensure that all environmental and social impacts have been identified and successfully addressed. Project activities were screened for Climate Change and Disaster Risk.

**World Bank Grievance Redress Service:**

Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

**Risks**

Explanation:

Overall, risks will remain the same as identified for the original project.

Inherent risks associated with the project activities can be identified as:

- i. Central and local government authorities are too weak to implement the project: MEM has developed substantial experience in implementing Bank-funded projects over the past 15 years.

Capacity needs and gaps have been identified and the project will be supporting further training and staff development.

ii. Political and governance risks: these include risk of political reversal toward ASM following the upcoming political transition. They are mitigated by the fiduciary safeguards of the project and by the popular support enjoyed by ASM initiatives, regardless of political affiliation.

iii. Macroeconomic risks or other factors preclude government from sustaining its financial commitments under the project: this risk is mitigated by the positive medium and long term prospects for gold prices compared to other commodities and the potential for stimulating mining-induced growth, especially in rural areas.

iv. Weak institutional capacity for implementation and sustainability: the project is drawing on the Chilean model to build the capacity of STAMICO, the Geological Survey, the Tanzania Investment Bank, and the Zonal Mines Offices as the agents for transformation of ASM.

v. ASM development exacerbates land use conflicts between ASM and LSM, or between ASM and farmers. The project mitigates this risk supporting the Geological Survey of Tanzania to conduct ground surveys, mapping and prospecting services to better delineate orebodies and extend reserves.

vi. Project benefits are captured by elites and selection of Small Grants beneficiaries is politicized and perceived to not reflect geographic distribution of Project areas. This risk is mitigated by the strict eligibility criteria of the Grant Manual, participatory monitoring of compliance, and multiple oversight layers at local, central and intersector levels.

vii. Over-subscription to the training and demonstration activities which could result in high demands not met by the Project resources. This risk is mitigated by the Government's commitment to set up its own Grant Program which would leverage the Bank-funded program.

viii. Unintended effects when support particularly with respect to demonstration units, operation of demonstration centers, and use of financial assistance could result in parallel growth of informal mining and amplify existing health, safety and environmental risks associated with ASM. The project mitigates this risk by limiting the number of centers supported to no more than seven, by opting for gradual deployment of demonstrations and drawing lessons at each stage.

## Annex I: Result Framework

TZ Sustainable Management of Mineral Resources (P151124)

### Results Framework

Project Development Objectives							
Original Project Development Objective - Parent:							
To strengthen the Government's capacity to manage the mineral sector to improve the socioeconomic impacts of large and small-scale mining for Tanzania and Tanzanians and enhance private local and foreign investment.							
Proposed Project Development Objective - Additional Financing (AF): no change							
Results							
Core sector indicators are considered: Yes				Results reporting level: Project Level			
Project Development Objective Indicators							
Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
No Change	Percentage increase of household income levels in selected ASM communities	<input type="checkbox"/>	Percentage	Value	0.00	200.00	100.00
				Date		20-Nov-2014	30-Jun-2015
				Comment	2009-baseline US\$4/day	End Target fully achieved.	US\$8/day
No Change	Percent of citizens in participating communities who consider that their views have been taken into account in the local economic development strategic planning process (perception survey)	<input type="checkbox"/>	Percentage	Value	12.00	35.00	60.00
				Date	31-Dec-2010	20-Nov-2014	30-Jun-2015
				Comment	Based on field survey under the Benefits Study		

No Change	Time to process mineral rights (exploration licenses).	<input type="checkbox"/>	Months	Value	18.00	1.00	2.00
				Date	09-Jun-2009	20-Nov-2014	30-Jun-2015
				Comment	15 Months was a rough estimate at appraisal and was underestimated.	End Target fully met and exceeded. Time to process has dropped from 15 months to 1 month.	No more than two months for review and approval of prospecting licenses.
New	Time taken to transform identified ASM areas into established PML mines.	<input type="checkbox"/>	Months	Value	12.00	12.00	3.00
				Date	20-Feb-2015	20-Feb-2015	31-Dec-2018
				Comment			
No Change	Annual publication of mining sector revenue	<input type="checkbox"/>	Yes/No	Value	No	Yes	Yes
				Date	30-Jun-2009	20-Nov-2014	30-Jun-2015
				Comment		End Target fully achieved.	Fourth report and compliant status
New	Annual publication of mining sector revenue with an ASM annex.	<input type="checkbox"/>	Number	Value	0.00	0.00	4.00
				Date	20-Nov-2014	20-Nov-2014	31-Dec-2018
				Comment			
No Change	Improvement in Tanzania's ranking as a mining investment destination as evidenced by independent investor survey (Fraser Institute).	<input type="checkbox"/>	Text	Value	48/71 for policy ranking & 22/71 for mineral potential	Tanzania has risen back up this year to 62.	Increase of 2-3 points/places or more over baseline in one or both indicators.
				Date	30-Jun-2009	20-Nov-2014	30-Jun-2015

				Comment			
No Change	Percentage increase in mining revenue	<input type="checkbox"/>	Percentage	Value	0.00	52.00	5.00
				Date	30-Jun-2009	20-Nov-2014	30-Jun-2015
				Comment	First EITI Report showed consolidated revenue of \$100million.	End Target fully achieved. End of Project target was a 5% increase on US\$400 million. Revenue in 2013 was reported at US\$1.15 billion (source: Tanzania EITI)	Revenues increase of 5% over baseline.
New	Percentage increase in share of royalty from PML holders.	<input type="checkbox"/>	Percentage	Value	7.00	7.00	7.50
				Date	20-Nov-2014	20-Nov-2014	31-Dec-2018
				Comment			
<b>Intermediate Results Indicators</b>							
Status	Indicator Name	Core	Unit of Measure		Baseline	Actual(Current)	End Target
New	Regulatory gaps addressed (Value Addition Regulations, Explosives Regulations, EITI Bill)	<input type="checkbox"/>	Yes/No	Value	No	No	Yes
				Date	20-Feb-2015	12-Feb-2015	31-Dec-2018
				Comment			
New	Number of ASM operators benefiting from technical capacity building services provided by the project.	<input type="checkbox"/>	Number	Value	20	20	100,000
				Date	12-Feb-2015	12-Feb-2015	31-Dec-2018
				Comment			
Revised	Increase in total aggregate production value from ASM	<input type="checkbox"/>	Text	Value	\$4/day	\$20/day	\$50/day
				Date	09-Jun-2009	20-Nov-2014	31-Dec-2018

	beneficiary areas.			Comment	Baseline. Yearly targets to be developed		
New	Reduction in child labor participation in PML areas benefiting from the project	<input type="checkbox"/>	Text	Value	N/A	1.8% of miners	75% reduction
				Date	12-Feb-2015	12-Feb-2015	31-Dec-2018
				Comment			
New	Number of new incorporations of ASM cooperatives, SMEs or associations as a result of new initiatives.	<input type="checkbox"/>	Number	Value	250.00	250.00	400.00
				Date	07-Oct-2014	20-Nov-2014	31-Dec-2018
				Comment	250 associations and enterprises established		
New	Number of PMLs registered (cumulative)	<input type="checkbox"/>	Number	Value	14,880	28,000	45,000
				Date	07-Oct-2014	20-Nov-2014	31-Dec-2018
				Comment			
New	Number of districts with strategic development plans that integrate mining communities.	<input type="checkbox"/>	Number	Value	3.00	3.00	6.00
				Date	07-Oct-2014	20-Nov-2014	31-Dec-2018
				Comment			
No Change	Revised mineral law and regulations disseminated	<input type="checkbox"/>	Text	Value	Revisions ongoing	End Target fully achieved.	Revisions and dissemination completed.
				Date	09-Jun-2009	30-May-2014	30-Jun-2015
				Comment			
New	Number of graduates in value addition from the Tanzania Gemological Centre	<input type="checkbox"/>	Number	Value	0.00	0.00	200
				Date	07-Oct-2014	12-Feb-2015	31-Dec-2018
				Comment			
New	Number of inspections completed	<input type="checkbox"/>	Number	Value	1000	1600	2500

	according to the new mines inspection checklist and new environmental protection plan			Date	09-Jun-2009	20-Nov-2014	31-Dec-2018
				Comment			
No Change	Percentage of country covered by geophysical airborne surveys at 1:100,000 scale.	<input type="checkbox"/>	Percentage	Value	3.00	15.70	14.00
				Date	09-Jun-2009	30-May-2014	30-Jun-2015
				Comment	3% of the country covered by airborne geophysics	End target fully achieved.	
New	Number of areas suitable for ASM identified and set aside for permitting.	<input type="checkbox"/>	Number	Value	4.00	4.00	12.00
				Date	07-Oct-2014	20-Nov-2014	31-Dec-2018
				Comment			
No Change	Project monitoring and evaluation.	<input type="checkbox"/>	Text	Value	Project start	In progress	Successful M&E
				Date	09-Jun-2009	20-Nov-2014	30-Jun-2015
				Comment	Project M&E system, building on results framework, to be developed in Year 1	ASM Baseline to be incorporated into M&E.	Regular project reporting will be used to track project results.
New	ASM database established and updated quarterly	<input type="checkbox"/>	Yes/No	Value	No	No	Yes
				Date	20-Nov-2014	20-Nov-2014	31-Dec-2018
				Comment			
New	Compliance with Minamata Convention on Mercury Reduction Target	<input type="checkbox"/>	Yes/No	Value	No	No	Yes
				Date	12-Feb-2015	12-Feb-2015	31-Dec-2018
				Comment			

## **Annex II: Detailed Project Description**

### **1. Project Overview**

1. The SMMRP IDA Credit was approved by the Board on June 9, 2009 for a total amount of SDR 33.5 million (about US\$50 million equivalent). The project was launched on September 17, 2009 and became effective on September 22, 2009. The original project received a one year extension from June 30, 2014 to June 30, 2015 to complete key activities and provide a bridge to the Additional Financing.

2. An important goal of the current project was to increase the benefits from mining to Tanzanians. To this end, the project targeted three main stakeholders: i) artisanal and small-scale miners; ii) communities affected by mining activities (whether large or small scale activities); and iii) artisans who work on value addition, primarily from industrial stones or gemstones. Over the course of the last two years, small pilots with these three stakeholder groups have proven successful but insufficient for the intended impact. It is the intention of this Additional Financing to further scale up these successes, and in the process, to work with those in the Ministry at the local level who are responsible for providing regulation and technical assistance in the selected activity areas.

### **3. Sector Context**

3. The GoT, under its National Strategy for Growth and Poverty Reduction (MKUKUTA), is committed to economic growth and reduction of income poverty, improvement in the quality of life and social well-being, and improved national governance and accountability to its current population and future generation. The World Bank has been supporting government's reforms in the sector over the past four decades. In the mid-1980s, support focused on geological infrastructure required to identify the mineral resources of the country. This was followed by a loan in the early 1990s to attract FDI through necessary regulatory changes. The current Bank loan, which was made in 2009, has supported a focus on further geological knowledge, strengthened government capacity to monitor in the districts, and better provisions for social and environmental management. Due in part to these sector reforms, Tanzania has experienced strong, relatively steady FDI in mining, which in turn fueled a robust sector and macro-economic performance over the last decade, with GDP growth anchored at an average of 7 percent per annum. Mining contributes about 3.5 percent to GDP but the sector is expected to grow by 7.7 percent and to contribute 10 percent to GDP by 2025. The proposed Additional Financing focuses on translating the successful mining-induced macroeconomic growth of the past decade into broad-based socio-economic development and shared growth, particularly at the sub-national levels.

4. The mining sector has been growing at an average rate of 10.2 percent since 2000, representing the bulk of FDI flows into the country. The mining boom started with massive inflows of FDI in the mid-1990s, which were made possible in part by the reforms described above. Notable developments over the past decade include the commissioning of seven large-scale gold mines (Bulyanhulu, Buzwagi, Geita, Golden pride, New Luika, North Mara and



Tulawaka). During this period, more than 15 mineral prospects of gold, nickel, and uranium have also been developed to various stages of exploration. The mining boom resulted in an increase of the country's annual large gold production from 0.13 million troy ounces in 1999 to about 1.3 million troy ounces in 2012, making Tanzania one of the largest gold producers in Africa. In 2013 the production of the major producing mines was 1.24 million troy ounces of gold (valued at US\$1.74 billion); 12.7 million pounds of copper (valued at US\$40.95 million); and 0.38 million troy ounces of silver (valued at US\$8.93 million). In addition 3.24 million grams of tanzanite were produced at the Tanzanite One mine and 158,562 carats of diamonds at the Williamson Diamonds mine.

5. Between 1998 and 2011, cumulative mining FDI was US\$3 billion. Since 2008, mining FDI represented 30 to 50 percent of total annual FDI flows, resulting in the commissioning of seven mines. As a result of these developments, Tanzania became one of largest producers of gold in Africa, competing with Mali for the third place behind South Africa and Ghana. Industrial production from large scale mines started with 628.6 troy ounces in 1998 ramping up to 134,658 troy ounces in 1999. Since then, production has increased rapidly, peaking at 1.4 million troy ounces in 2004 and 2005 and stabilizing around 1.2 million ounces annually through 2013. Table 1 shows the trends of the value of mineral productions differentiated between large and medium mining and small-scale mining.

6. Gold remains a leading foreign exchange earner despite decline in exports from US\$2.8 billion in the year ending in October 2012 to US\$1.75 billion and US\$1.35 billion respectively in October 2013 and October 2014. This decline, resulting from adverse market conditions (fall of prices to about US\$1200 per ounce), has relegated gold to the position of second major export earner after tourism. According to estimates from the Tanzania Minerals Audit Agency, planned mine production, expansion and new development between 2014 and 2023 could not only increase gold production, but also diversify minerals produced (commission of the Mkuju River uranium mine and the Kabanga nickel mine) and generate nearly US\$2.5 billion in fiscal revenues. Also, with the recent discovery of significant natural gas reserves, extractive industries are expected to become the engine of growth in the country.

**Table 1: Value of Tanzania Mineral Production by Size of Operation**

Mineral	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Value of large and medium mining production (millions of US dollars)											
Gold	596.6	639.6	772.1	888.9	992.8	1152.2	1436.2	1879.6	1752.7	1640.1	1752.7
Diamonds	33.7	25.4	25.9	28.9	22.4	22.7	16.3	11.3	42.9	82.1	42.9
Tanzanite	24.3	34.0	36.2	48.5	45.5	15.8	25.4	22.9	39.3	29.2	39.3
Other Gemst	2.6	6.5	10.3	6.6	4.4	4.8	6.1	9.0	11.1	20.0	11.1
Salt	2.1	1.6	2.0	2.2	2.4	3.5	4.0	3.7	2.3	5.3	2.3
Phosphate	0.5	0.0	0.3	0.7	0.4	0.1	0.5	0.5	0.2	0.1	0.2
Bauxite		0.0	0.1	0.1	0.5	2.1	1.0	1.4	4.4	2.0	4.4
Gypsum		0.1	0.0	0.1	0.6	0.1	0.1	0.1	1.1	2.5	1.1
Silver	3.0	1.6	5.5	5.3	6.7	5.0	7.7	11.6	17.2	10.3	17.2
Copper	12.2	11.6	19.9	21.1	18.2	11.5	36.7	43.2	42.1	43.7	42.1
Copper Ore				0.2	5.0	0.6	1.1	0.8	1.6	2.2	1.6
Marble				8.6	36.7	0.5	1.7	0.8	0.9	0.2	0.9
<b>Total Value</b>	<b>674.9</b>	<b>720.5</b>	<b>872.2</b>	<b>1011.1</b>	<b>1135.5</b>	<b>1219.1</b>	<b>1537.0</b>	<b>1984.8</b>	<b>1915.8</b>	<b>1837.6</b>	<b>1915.8</b>
Value of small-scale mining production (US dollars)											
Gold	19,416,483	13,802,571	95,136,101	113,966,372	104,136,437	123,703,658	71,345,178	66,130,970	89,170,695	53,974,977	57,642,429
Diamond(c	2,090,876	3,100,705	5,396,274	6,814,623	6,309,294	5,759,161	4,755,562	2,213,539	2,578,585	6,001,722	6,738,670
Tanzanite	24,254,457	34,016,728	20,757,608	29,200,927	22,103,371	9,091,121	17,777,726	13,462,239	14,101,095	33,129,057	22,483,964
Other Gem	2,635,543	6,513,272	10,256,148	6,597,877	4,356,041	4,848,712	5,495,975	6,309,407	16,831,283	44,234,441	31,525,922
Salt	26,233	19,963	18,226	2,174,077	2,384,155	3,482,201	4,037,962	3,699,291	3,942,215	3,953,181	2,020,089
Gypsum		2,400	5,650	74,066	648,000	84,016	126,074	98,915	216,861	1,733,314	2,517,993
<b>Total value</b>	<b>48,423,592</b>	<b>57,455,638</b>	<b>131,570,007</b>	<b>158,827,943</b>	<b>139,937,299</b>	<b>146,968,869</b>	<b>103,538,476</b>	<b>91,914,362</b>	<b>126,840,734</b>	<b>143,026,691</b>	<b>122,929,068</b>

Source: Ministry of Energy and Minerals

## 5. Rationale for Scaling up Support for ASM Activities

7. The Government's Artisanal and Small-Scale Mining (ASM) formalization agenda relies on demarcating exclusive areas for ASM and providing financial and technical support (including geology, mining and environmentally-sound processing methods) to build artisanal and small-scale operations with respect to national environmental laws and international best practice. As of January 2015, the government has demarcated 25 exclusive ASM areas covering a total acreage of 2,047 square kilometres. With these new lands available, the government received 1700 new applications for Primary Mining Licenses (PMLs).

Early results of the original SMMRP provide strong basis for scaling up the ASM formalisation agenda through Additional Financing to the SMMRP. These include:

### A. Leveraging the positive ASM response to government policy and institutional reforms

- *Legislation in place to encourage the regularization of ASM:* With support from SMMRP, Tanzania became the most improved jurisdiction in Africa in terms of ASM policy and law. The Mining Act 2010, which replaced the Mining Act of 1998, and ASM

regulations with specific ASM provisions including demarcation, decentralization of the permitting process, and more stringent standards on “no child labor”, limitations on mercury use and general environmental remediation.

- *Strengthened institutional capacity to meet new legislative requirements:* The monitoring capacity of the Ministry of MEM has significantly improved. With decentralization of the permitting process through established Zonal Mining Offices, rates of registration have increased substantially while the time for processing titles has reduced significantly. The number of PMLs has reached 35,000 in 2015 from a baseline of 14,800 in 2009. PML licensing has been decentralized, and processing time was reduced to 1 month compared to 4 months in 2011, a standard of best practice in the region. Furthermore, monitoring of sites has become more regular as evidenced by a 352 percent increase in the number of audits conducted for ASM.
- *Availability of demarcated land for ASM growth:* The Geological Survey of Tanzania has helped to delineate a number of geological structures suitable for the small-scale mining of gold and tanzanite. These have resulted in an increase of demarcated areas for ASM to a total of 25 in 2014 from 2 in 2009.
- *Easy process for obtaining licenses:* The Mining Act allows small-scale miners to obtain Primary Mining Licenses for US\$12 and renewed for US\$24 every seven years. PML holders also pay annual surface rental fees of US\$12/ha for gold and gemstone and US\$20 for minerals other than gold and gemstone.

B. Meeting increased demand to address technical and financing constraints to ASM development

8. A total of 8,800 PMLs have been granted within the demarcated areas, but only 626 PMLs are active (about 7 percent). The low level of activity around PMLs is due to undercapitalisation, whereby an operator has acquired legal title but does not have the means (financial or technical) to develop the mining property in an optimal fashion. Undercapitalisation is exacerbated by insufficient knowledge of the size, direction, and depth of the ore body and lack of appropriate equipment and technology to reach deeper veins and efficiently process low-grade so as to make a profit. Another reason for low activity is the low barrier to entry (the easy process and low cost of obtaining a PML) which could allow non-miners to acquire rights for speculation purposes. However, the PML is limited in terms of area and duration. It covers a maximum area of 10 hectares and is valid for 7 years. It can be renewed if the holder is in good standing with respect to meeting regulatory obligations. Financial and technical constraints have been the major impediment to the development of ASM. To overcome these constraints, the government has introduced financial assistance to small-scale miners. In the original project, a SGP made available US\$1M to small-scale miners to improve mining practices on their PMLs. The trial period generated great interest from miners: For the first phase of the SGP, there were 71 grant applications valued at US\$3,496,952, but only 11 successful applicants could be selected for the available amount of US\$500,000 for a PML holder, regardless of project size.<sup>6</sup> The availability of financial assistance has also shown that more miners are willing to move

---

<sup>6</sup> The government ran concurrent to the Small Grants Program its own loan program whereby 51 applications valued at TZS 15.6 billion (about US\$9.2 million) were received, and 41 met the eligibility criteria for a total amount of TZS 13,345,464,400 (about US\$7.9 million).

towards formal titles in order to qualify for grant funding and loans.

C. Mitigating the risk of land-use conflicts between ASM and LSM

9. The rapid growth of large-scale mining in Tanzania since the mid-1990s has been accompanied with conflicts between ASM and LSM which threaten to erode the position of Tanzania as a favored destination for FDI in mining. A number of large-scale mines currently in operation sprung on artisanal mining sites which were later allocated to foreign mining companies for large-scale operations. Small-scale mining communities expected that large-scale mining would generate enough socio-economic benefits as to compensate for the loss of ASM activity in the new licensed ground. As these expectations failed to materialize, the incursion of ASM into LSM concessions became frequent and increasing violent, especially in North Mara. The AF will mitigate the risk of ASM-LSM conflict by supporting activities aimed at developing ASM into viable small and medium mining operations within ASM demarcated areas, and by extending the activities of the Multi-Stakeholder Partnership on ASM between government, ASM associations, and LSM companies.

D. Harnessing ASM potential for reduction of rural poverty

10. Tanzania has experienced a rapid growth of large-scale mining since it launched a liberalization program in the early 1990s. However, the benefits of mining in-terms of poverty reduction and shared prosperity have been below expectations.

11. Currently, ASM contributes roughly 10 percent to Tanzania's gold production but accounts for a disproportionate share of employment (over 95 percent the sector's employment). It is also a significant source of gemstones, copper ore, iron ore, tin, bauxite, industrial minerals and building materials. Typically, the activity generates four jobs for every person involved. The work structure of an ASM operation comprises an official claim holder who outsources the mining work to a number of pit owners who in turn use permanent ASM workers, casual laborers and service providers. For gold and gemstone mining, each pit employs about 15 people who work on a production sharing arrangement. The claim holder receives 30 percent in compensation for his risk (as owner of the license, the claim holder is liable for meeting all government regulations). The pit owners claim 30 percent to 40 percent of the production as compensation for their business, financial, and operational risks. The remaining 30 percent is shared among the mine workers as compensation for their labor. Mine workers can earn between US\$1000 to US\$2000 per month during peak periods, but this income is very volatile as it is subject to market and geologic risks.

12. One way to help stabilize the income stream for miners is to increase the certainty of estimate of the economic value of the deposit by improving the geological knowledge of the orebody and better defining the shape and depth of the mineral bearing veins. To this end, the government has set aside demarcated areas for ASM where further geological investigation would be conducted to define the mineable reserves and better guide the miners in their effort to follow the mineralized veins. Since 2004, more than 589,613 hectares have been demarcated as ASM exclusive areas. The government is focusing its financial and technical support to ASM operators who agree to register their operations and work within the demarcated areas. In response to incentives and facilitation services provided by the government, more and more

ASM operators are choosing to be registered and to work under a valid Primary Mining License (PML). As a result of increased ASM registration, there has been a steady increase in royalties and mine fees paid to the government. For instance, the annual surface rents collected by the Ministry of Energy and Mines from these operators increased from 143 million Tsh in 2009 to roughly 3 billion Tsh in 2013. In addition 4.35 billion Tsh royalties were collected from PML holders in 2013.

#### E. Improving environmental and social performance

13. The AF will include in its result framework specific targets for tracking child labor and mercury contamination. The Inspection unit will finalize an inspection checklist including the enforcement of proper use and disposal of hazardous wastes, the implementation of the Environmental Protection Plan (EPP), the soundness of tailing disposal systems, and the use mercury abatement technology for gold recovery. In addition, the checklist will include provisions for enforcement of anti-child labor legislation. In order to track environmental and social performance, the Project Management Unit would include staff from the Environmental Management Unit and from the Monitoring and Evaluation Division. These new members of the PMU will be tasked with producing periodic reports of environmental and social performance.

### **6. Centers of Excellence**

14. As part of the implementation of the Strategic Plan for Mercury Management, and also to meet its obligations under the Minamata Convention, the GoT has opted to accelerate the rate of formalization of ASM with a view to addressing the social and environmental problems (especially mercury pollution) of the sector while also maximizing its socio-economic impact. To this end, GoT is proposing the establishment of Centers of Excellence (COEs) in ASM hot spots throughout the country to serve as catalysts for the technical, financial, environmental and social transformation of ASM. Seven centers have been identified based on the importance of ASM operations, their potential to become viable and environmental sound growth poles for local small- and medium-scale mining enterprises, and the degree to which environmental and social risks could be managed.

15. In view of the significant environmental and social risks of the unregulated operations in the these areas, the GoT moved in to regulate them by demarcating the area, designating it as exclusive areas for ASM, registering operators in the area, and issuing them primary mining licenses (PML) according to the provision of the Mining Act 2010. The PML is issued only to Tanzanian nationals or companies and cover an area of 10 hectares. It is valid for 7 years and can be renewed if the holder is in good standing with respect to meeting regulatory obligations. The COEs will help modernize ASM by promoting the organization of ASM operators into registered corporate entities in exchange for technical and financial assistance.

16. The centers focus on existing, established small-scale mines or on prospecting licenses that were relinquished by large mining companies. Years ago, many of these sites started spontaneously and became “gold rush” areas attracting hundreds or thousands of transient miners. The COEs will help modernize ASM by promoting the organization of ASM operators into registered corporate entities in exchange for technical and financial assistance.

17. The following activities are proposed for the COEs:
- A. Extension of ZMOs offices on already established compounds owned by the MEM to serve as capacity building and training hubs in a given mining zone:
    - (i) minor civil works to extend existing ZMO offices on already established compounds to create space for classrooms, conference rooms, information centers, workshops;
    - (ii) provision of classroom demonstration equipment;
    - (iii) preparation and dissemination of training manuals;
    - (iv) recruitment of consultants to do training of trainers modules on topics such as mine development, safe mining practices, occupational health and safety, and environmental safeguards;
    - (v) provision of business development services.
  - B. Upgrading of demonstrating sites:
18. The demonstrating sites take the in-class knowledge acquired in Point A and apply it *in-situ*. The demonstrating sites are existing STAMICO mine properties, where facilities for processing exist but could benefit from upgrading of technology.
19. Introduction of environmentally sound on-site processing technology will be a focus of the support from the Additional Financing. The vision is for each COE to be served by an on-site processing facility which will promote environmentally sound and technically efficient processing techniques. The facility will include the following:
- a. Mercury-free processing facility: introduction of mercury-free modular gold processing plants, such as the Gold Kacha Concentrator developed by Appropriate Process Technologies of South Africa, which is gaining popularity among ASM operators because of the process ability to improve recoveries (therefore income) while also eliminating the need for mercury use. The technology can process up to three metric tons of ore per hour and can be calibrated to the local processing needs of ASM operators.
  - b. Mercury abatement technology: introduction of mercury control processes for ASM operators unable or unwilling to shift to mercury-free processing. This includes the Gold Shop Mercury Capture System developed by the US EPA and Argonne National Laboratory. A blue print of this system is publicly available to enable manufacturing and installation by local industries. The system can be developed at low cost by local manufacturers based on blue prints provided by the US EPA. The system can reduce mercury emissions by over 80 percent and has been successfully tested in Latin America where it has resulted in substantial reduction of mercury pollution.
  - c. Carbon separation for Value Added Tax (VAT) Leach producers: a number of small-scale to medium scale producers use cyanide leaching to recover gold from low grade ores. The operations are under strict environmental requirements, but the locally-made elution machine has been inefficient in separating gold from carbon thus

resulting into poor recovery of the gold and environmental pollution. A modern elution machine available in Zimbabwe is intended to be procured to help boost the recovery from the VAT leaching. The system utilizes pressure and caustic soda to elute the gold from the carbon. In addition to improving the elution machines, the gold recovery process is hampered by waste of the carbon required for the process. Normally the carbon used for elution is recycled and reactivated to ensure maximum absorption of the gold. However, lack of reactivating machines in Tanzania has resulted in improper disposal of several metric tons of carbon. A simple regenerating kiln available in South Africa will be sourced to ensure the carbon are recycled and used to the process and thus reduce the operating cost and environmental pollution associated with VAT leaching. Similar equipment will then be developed using local manufacture

20. The experience of Chile shows that ENAMI, a State Mining Corporation, played a central role in development of a modern small and a medium mining sector in Chile. Similarly, the Minerals Commission of Ghana was instrumental in the success of ASM development. STAMICO could play a similar role in Tanzania. This is why the project proposes to enhance the capacity of STAMICO to fulfill its mandate as a service provider to small-scale miners, including management of the processing facilities. To this end, a South-South exchange between STAMICO and ENAMI of Chile is envisaged early on to provide STAMICO with a successful model for potential replication in Tanzania. Following the exchange, further in-country activities will include a business planning exercise to move STAMICO towards an autonomous institution with a fee-recovery model in place, sustained by the processing fees it charges to miners. It is also anticipated that as part of the review of the regulations on trade of chemicals used by ASM, an assessment of STAMICO will be conducted to determine its suitability as the appointed, licensed entity for import and sale of controlled chemical products to ASM operators. The justification for STAMICO's involvement on a fee-based model for providing services to small and medium mining operators rests on the example of ENAMI in Chile and on the promising results that STAMICO has recently achieved as a provider of technical and consulting services to the private sector.

## **7. Small Grants Program (SGP)**

21. The design of the Grant Program was informed by a pilot program under the original project. Under the pilot, small grants were provided to 11 beneficiaries. The grant proceeds were used to improve efficiency of production of gold and support value addition for tiles and salt production. The grants also enabled beneficiaries to prepare an EPP for activities in their site and to undertake geological investigations to support long term production plans. Initial evaluation of the SGP under the original project indicates that grant recipients are using the proceeds to undertake further exploration to define the reserve of deposit and develop a long term mining plan. Funds were also used to purchase cutting machines for value addition of building materials, packaging systems for value-added minerals, generators to run water pump, production process improvement for salt mining, and geological services.

22. The Additional Financing will support expansion of the original Small Grants Program from three to seven zones, and increase the total financial envelope from its current total of \$1

million to \$3 million. At least 30 per cent of the applications must be with women –run or women –led businesses. Grants may be considered to a maximum of US\$100,000 per applicant for small scale mining and related activities such as expansion of production, improving mineral recovery and value addition and a minimum of US\$5,000 to a maximum of US\$15,000 for alternative business and skills development activities and related items.

23. Support focuses primarily on holders of Primary Mining Licenses (PML). The Mining Act (2010) has made provisions for promoting small-scale mining through the PML provisions. In the Act under section 4 (1) provides an interpretation of “Primary Mining license” as a license for small-scale mining operations, whose capital investment is less than US\$100,000 or its equivalent in Tanzanian shillings.

24. The extension of the Small Grants Program under the Additional Financing intends to enable miners to upgrade technology on sites, and to acquire specific mining technical and business management skills. A 30 percent quota for women beneficiaries in the initial Small Grants Program will be retained in the second phase. The management of the Small Grant Program will draw on the financial services of TIB which will handle procurement and fiduciary aspects of the Program under a Memorandum of Understanding with the Ministry of Energy and Minerals.

25. The specific objectives of the SGP in the Additional Financing are to:

- Build capacity of miners in legal, technical, organizations, environmental and safety aspects of ASM *as well as* government authorities to provide gender-responsive extension services in each of these areas to increase productivity and incomes to ASM.
- Support organization, formalization and legalization of artisanal and small scale miners;
- Reduce poverty, improve quality of life and enhance both mining and non-mining livelihood opportunities and outcomes in ASM communities;
- Enhance credit-worthiness of SGP beneficiaries through support for entrepreneurial ventures, strengthened business management capacity, enhanced capacity to build savings and access loan-based financing;
- Build capacity and empower beneficiaries and their communities through improved governance and increased participation.
- Support strong, effective ASM individuals/associations that are gender-responsive, transparent, accountable, and inclusive; and
- Strengthen relationships between miner’s organizations (cooperatives, associations, etc.) and government authorities mandated to provide ASM guidance and oversight.



## **Annex III: Lessons of ASM Development: Case Studies of Chile and Ghana**

### **I How Chile evolved from artisanal mining to the status of world mining superpower**

1. Located in the Atacama Desert, the copper mine of Chuquicamata has dominated the history of copper mining in Chile. Archeological research has determined that the mine was operational as far back as 550 A.D. The Incas worked the mine by artisanal methods until the Spanish colonization, small scale mining activities continued until the War of the Pacific which pitted Chile against Bolivia and Peru during 1879-1883. The war resulted in the annexation by Chile of a vast area including the mine site. In the following years, Chuquicamata was the focus of a mineral rush, the ‘Red Gold Fever’ which attracted great numbers of artisanal miners. Hundreds of ASM claims were registered under the 1873 Mining Code. Chilean mining entrepreneurs began to emerge out of the small-scale mining business. Mining wealth fueled the growth of agriculture; wine making became a second source of wealth, while banking also prospered as resource-backed loans or equipment advances became acceptable means of financing small-scale mining ventures.

2. By the late 1800s, foreign mining entrepreneurs and explorers began to buy up and consolidate the small mine claims of artisanal miners. In 1904, an American mining engineer named William Braden bought the El Teniente copper deposit from small-scale miners. He established the Braden Copper Company, which began mechanized mining on the areas large copper deposit. But the capital requirements of modernizing the mine proved to be beyond the financial means of a small-scale miner. In 1909, Braden sold a controlling share of his small-scale company to the Guggenheim Brothers who owned a US-based multinational mining and refining business. As a result, the Guggenheim Exploration Company (Guggenex) was established to build a copper refinery and smelter at an initial cost of US\$25 million<sup>7</sup>.

3. Inspired by the experience of William Braden, another American mining engineer named Albert C. Burrage bought the Chuquicamata property but soon realized that he did not have the financial means to develop it. In 1910, Burrage sold the mine to stock valued at US\$25 million to Chile Exploration Company (Chilex) which was established by the Guggenheim Brothers to develop the mine<sup>8</sup>. The following years saw the entry of US multinational corporations which brought new extraction technology for lower grade ores and significant capital investment. In 1916, Kennecott Copper Corporation, then the world's largest copper producer, acquired El Teniente, and in 1923 the Guggenheims sold the controlling interest of Chuquicamata to US mining giant Anaconda Copper for US\$70 million. Anaconda expanded the capacity of Chuquicamata to 170,000 metric tons of fine copper per year by 1927 and 222,000 metric tons by 1941, making it the largest copper mine in the world. After nearly 100 years as the world's largest producing copper mine, Chuquicamata has recently ceded this position to the nearby Escondida mine.

---

<sup>7</sup> <http://www.fundinguniverse.com/company-histories/corporacion-nacional-del-cobre-de-chile-history/>

<sup>8</sup> Michael Coulson (2012): *The History of Mining: Events, Technology and Peoples that forge the Modern World* – Harriman House, Hampshire, UK.

4. Recognizing the need to encourage Chilean nationals to participate in the growth of the mining sector, the government adopted a policy for supporting the development of the small- and medium mining sector. In 1927, it established the “Caja de Crédito Minero” (Mining Credit Fund) to provide financial assistance and loans to small-scale miners. This was followed in 1930 by a sector strengthening project (Projecta Ayuda al Sector) which paved the way for the establishment of a Ministry of Mines in 1953, the Copper Department in 1957, and the ENAMI (“Empresa Nacional de Minería”) in 1960. ENAMI’s mission was to promote the development of private small and medium scale mining. It provided loans primarily to small scale miners for developing new operations or upgrading their mining facilities or equipment. It also assisted about 450 small-scale mining companies in getting access to processing facilities by purchasing their ores and concentrates, processing them in its plants and smelter, and then selling the value-added products (cathodes and refined copper) at world market prices.

5. ENAMI’s support to miners stimulated a rapid growth of modern small- and medium scale mining enterprises and the phasing out of artisanal mining. By the mid-2000s, ENAMI has become a profitable state-owned firm with a turnover of about US\$1 billion and assets including one smelter, five processing centers, 12 purchasing agencies, and a network of technical support centers serving 1500 small and medium mining companies. ENAMI also participates as a partner in the large scale copper mining operations of two private sector companies, Quebrada Blanca and Carmen de Andacollo, and the medium size Delta Mine. Since 2000, its annual production hovered around 220,000 metric tons of refined copper, 160,000 kg of refined silver, 5,500 kg of gold, 46,000 kg of selenium, and 560,000 metric tons of sulfuric acid<sup>9</sup>.

6. The success of small and medium mining has created in Chile a national expertise for managing and operating copper mines. In 1966, this development prompted the passing of Law No. 16,425 on the “Chileanization of Copper”, paving the way for greater Chilean State involvement in foreign-dominated large scale mining companies. By 1967, the State had acquired majority interest in the major large-scale mines of the country, notably El Teniente, Chuquicamata and Salvador. In 1971, in a bold move, the government nationalized the large-scale copper mines, and in 1976 created the large-scale version of ENAMI which was called Corporación Nacional del Cobre de Chile (CODELCO) with a mission to manage and operate large-scale copper mines on behalf of the State. CODELCO has successfully managed the growth of the copper industry in Chile and has grown to be the world’s largest copper producer. At the same time, privately-owned, large-scale Chilean mining firms have started to emerge. For instance, Antofagasta Public Limited Company is the 33d largest firm in the London Stock Exchange; other mining groups, such as the Luksic Group, the Compagnia de Acero del Pacifico, the Compania Minera San Estaban Primera are gaining in importance.

7. Today, Chile is a mining superpower. It is the “King of Copper” accounting for 32 percent of world production and 28 percent of global reserves. Chile is also the world’s number one producer of rhenium, natural nitrates, lithium, and iodine. It occupies the third place in molybdenum production, the 8th place in silver, and the 14th place in gold. Mining contributed 12 percent to total GDP (a total GDP equivalent of US\$230 billion) in 2013. It further

---

<sup>9</sup> <http://www.enami.cl/english-overview/english-overview.html>

contributed nearly 60 percent to exports, and 34 percent of foreign direct investment.

## **II ASM Reform in Ghana: what worked and what did not work**

8. Small-scale mining in Ghana was most likely established in the 4<sup>th</sup> Century A.D, giving the country's name of the "Gold Coast".

9. In 1905, the British colonial administration banned small-scale mining, but the activity continued informally as a traditional occupation for a number of Ghanaians. It was not until 1989 that there was a legal recognition of artisanal and small-scale mining (ASM) through the enactment of PNDC Law (Provisional National Defence Council) 218 known as "the Small Scale Gold Mining Law." The law paved the way for a formalization process which saw hundreds of individuals and cooperatives register their small-scale mining operations. This process was guided by the Small-Scale Mining Project under the Minerals Commission. The Commission established seven District Offices staffed with mining engineers and inspectors to oversee ASM administration and extension services, including financial assistance, training on mining techniques and logistics support. The government also established the Precious Minerals Marketing Corporation with a mission to purchase gold from registered small-scale miners.

10. To solidify these extension services, the Tarkwa Mining Center was established as a demonstration center. It was equipped with a lab and a processing plant to demonstrate best practices on gold recovery. The government established a buying office on-site to facilitate gold purchase directly from the miners. The government also put an office of the Mines Department on site to monitor the activities. In effect, the Tarkwa Mining Center represented a holistic approach towards addressing all the challenges facing the development of a formal, small-scale mining sector.

### ***What Worked***

11. A key feature of the 1989 Small-Scale Gold Mining Law was the simplification of licensing procedures for ASM and the demarcation of areas for small-scale mining. The 2006 Mining Act built upon lessons learned from the enforcement of the 1989 Act to address some shortcomings. The first area of improvement was further decentralization of ASM administration aimed at expanding the presence of the Minerals Commission in ASM areas to facilitate registration and the provision of extension services in nine District Offices. The second area of improvement was the demarcation of Designated Areas for ASM. The government identified 77 Designated Areas and made them available for small-scale mining licensing.<sup>10</sup> Every district office of the Minerals Commission was expected to have at least one designated area. Before mining takes place in a designated area, the Minerals Commission conducts a strategic environmental assessment of the area and carries out geological exploration to assess the viability of the deposit for small-scale gold mining. The area is then parceled into concession plots. The area of each ASM concession can be up to 25 acres, and is valid for five years renewable based on the right- holder performance during the first term.

---

<sup>10</sup> Poverty and Social Impact Analysis (PSIA) of Ghana Mining Sector Policies related to Artisanal and Small-Scale Mining (2012).

12. The formalization agenda initiated in 1989 has resulted in a significant growth of the contribution of ASM to the economy. During first four years, the program saw the registration of 400 properties. The share of ASM in total gold production grew from 3.2 percent in 1990 to nearly 28 percent in 2011. By 2013, small scale mining was contributing about 1.4 million ounces of gold accounting for 34 percent of the total gold production, with an estimated one million people directly involved in the activity. ASM also produces currently the totality of the country's diamonds.

13. In support of the formalization agenda, the government established four institutions which oversee the development of small-scale mining:

- The Minerals Commission is the institution responsible for the regulation of the mining sector. It has a Small Scale Mining Unit which conducts training and extension services, appraisal and approval of license applications and inspections. The Commission now has nine district centers responsible for registration, supervision, monitoring and technical support to artisanal miners.
- The Environmental Protection Agency (EPA) is an agency within the Ministry of Environment, Science and Technology with a specific mandate to conduct monitoring and assessment of the environmental issues related to small-scale mining at the permitting stage, educate miners about safe and environmentally sound operations, and enforce laws on environmental protection.
- The Precious Minerals and Marketing Corporation is mandated to purchase gold from all legal sources through its licensed buyers. It has a network of 800 licensed sub-buyers.
- The Geological Survey Department has the responsibility for this prospecting and undertaking surveys to identify and demarcate Designated Areas for ASM.

#### ***What did not work?***

14. The ASM development approach had been to conduct geological exploration and demarcate designated areas for ASM, organize small-scale miners into co-operatives or associations, and assist them to obtain a license. In spite of the achievements of this approach, the ASM sector has been beset with growing illegality, conflicts between ASM and LSM, and influx of foreigners engaging in illegal mechanized mining in ASM designated areas. These unintended effects resulted from implementation weaknesses of the government policies. These are described below:

- Complicated licensing procedures: The Small-Scale Gold Mining Law of 1989 was followed by the establishment of the Small-Scale Mining Project which was mandated to streamline licensing procedures. Although the procedures were simplified to enable ASM operators to apply for licenses at the District level, the district offices of the Minerals Commission were under-resourced and the decision making on licenses was still centralized, requiring miners to travel to Accra to finalize their permit applications.

Also, the independent environmental permitting by the Environmental Protection Agency became an additional requirement for which small-scale miners had little technical assistance to navigate the permitting process.

- Limited availability of prospective ground: The limited supply of suitable ground for ASM eventually led to ASM-LSM conflicts<sup>11</sup>, with frequent encroachment of LSM concessions, and even influx of foreigners using large-scale equipment to engage in illegal mining. A number of large-scale companies were confronted with a sudden influx of galamsey operators who are sometimes forcibly removed by security forces. The Geological Survey was not adequately resourced and was not exploring fast enough to satisfy the growing demand for ASM demarcated areas. Since large-scale mining concessions included near-surface deposits which are suitable for ASM, and the ASM demarcated were not adequate, resource conflicts became frequent and increasingly violent. Most of the ASM-LSM resource conflicts occurred in the Tarkwa and Ashanti Regions. In 2009, the Government prepared a comprehensive document, *Designated Areas for Small Scale Gold and Diamond Mining in Ghana*, which identified 47 areas which were reserved for ASM. However, there was no subsequent action to improve the viability of the designated sites.

### *Lessons for Tanzania*

15. *Legal recognition:* The Chilean experience shows that with legal recognition and financial support, artisanal mining activities gradually shifted toward formal small and medium mining. As a result, the Chilean legislation categorizes the sector into Medium Scale Segment (daily production of over 200 tons of minerals), and Small-scale Segment (daily production under 200 tons of minerals). Chilean Government support through ENAMI is tailored to the business needs of each specific segment. Tanzania has also recognized ASM in its legislation and demarcated areas for ASM. The lesson for Tanzania is to be more explicit on defining categories of ASM activities between artisanal, small-scale, and medium-scale mining, for the purposes of assistance. This could be done through a review of existing ASM policies and would allow for the government to calibrate assistance to the needs of each category. It would further accelerate the phasing out of artisanal mining by encouraging all the players to acquire a Primary Mining License (PML) and operate accordingly.

16. *Technical and financial support:* In Chile, ENAMI is the government's arm for providing technical and financial support to small- and medium-scale miners. It offers the following services: (i) small business advisory services including mining-venture financing, technical assistance for the preparation and evaluation of projects; (ii) business finance, including arranging loans for the implementation of mining development plans; and (iii) marketing assistance to facilitate access to the market by means of ore purchases. In this case, ENAMI either buys ores from small-scale miners to treat them in its processing plants, or purchases concentrates from small and medium-scale producers who are able to process their own ores. The concentrates are bought at the going international price of copper minus smelting and refining costs. This type of service reduces investments that individual small-scale miners

---

<sup>11</sup>Davidson, Jeffrey (1993). The transformation and successful development of small-scale mining in developing countries *Natural Resource Forum*.

would have to make in their own processing equipment, and also provides the country with value addition before export. It is in this sense, a win-win for miners and the government alike, as described in further detail below.

17. *Controlled facilities for processing:* ENAMI has five processing plants which are located in the mining areas with highest density of extraction activities. The José Antonio Moreno Plant in Taltal produces sulphides ores and oxydized ores with a production capacity of about 200 metric tons per month. The Osvaldo Martínez plant in El Salado processes oxide ores using leaching, solvent extraction and electro-winning methods with a production capacity of 800 metric tons of copper cathodes. The Manuel Antonio Matta Plant, located in Paipote has a monthly production capacity of 300 metric tons of copper cathodes. The Delta Plant in Ovalle has a production capacity of 400 metric tons of copper cathodes, and a flotation plant with a capacity of 60,000 metric tons of concentrates. ENAMI also offers smelting services to small and medium-sized operators to help them achieve the maximum value for their products. The range of services provided by ENAMI enables small and medium scale miners to develop larger mines, to get higher recovery from their ores by getting access to the same advanced processing and smelting facilities that are available to large-scale miners, to improve environmental performance by letting ENAMI handle the chemical treatment of the ore, and to get a higher price for their products by receiving from ENAMI the international price of contained copper minus the cost of processing and smelting services. Tanzania has already restructured STAMICO and given it a mission to contribute to the sustainable development of artisanal mining. The lesson for Tanzania is to build the capacity of STAMICO to progressively provide mining, processing and smelting services to small- and medium-scale miners in a similar fashion to ENAMI in Chile.

18. *Geological survey support:* Knowledge of the geology of the ore is critical to the sustainable development of small-scale and medium mining. In support of the development of the sector, the Chilean government created in 1980 the Servicio Nacional de Geología y Minas (SERNAGEOMIN) as part of the Ministry of Mines to provide specialized geology and mining services to the sector. The government also established Regional offices of SERNAGEOMIN in Regions I to V, and Region VIII to provide specialized services to the small and medium-scale mining sector, including mining exploration, environmental geology and geological risk assessment. In 1992, an amendment to mining and environmental regulations empowered SERNAGEOMIN with the authority to control the disposal of mining and processing wastes, including low grade ores, and to supervise tailing dams. In addition, SERNAGEOMIN coordinates with the Environmental Protection Department to conduct environmental impact assessment and report environmental pollution. In Tanzania, the functions of SERNAGEOMIN are vested in the GST and the ZMO. The lesson is to transform GST and the ZMOs into providers of capacity building services in ASM hot spots around the country.

19. *Institutional strengthening and coordination:* In its Mining Act of 1998, Tanzania adopted ASM policies which are similar to those of Ghana by opting for a legal recognition of ASM and by setting aside designated areas for ASM. Tanzania has further decentralized the permitting process, mandating this function to the ZMOs. In order to avoid the implementation weaknesses observed in Ghana, the project is proposing to strengthen the capacity of ZMOs by transforming them into Centers of Excellence for ASM, by enabling the Geological Survey of Tanzania to provide geological survey to delineate the ore bodies in Demarcated Areas, and by

providing mining exploration and reserve estimation services to individual PML holders.

## **Annex IV: Economic and Financial Appraisal**

### *Cost benefit analysis of supported activities*

1. The geological structure of Tanzania shows that medium and small deposits of gold, base metals, and precious minerals are spread across the country. The successful development of these deposits in a way that is economically, socially, and environmentally sustainable could make a significant contribution to poverty reduction, especially in rural areas.
2. However, unregulated ASM development carries heavy economic, social, and environmental costs. The objective of the Additional Financing is to minimize the negative impacts of ASM and enhance its potential positive impacts. The AF will emphasize enforcement of existing regulations, particularly in respect to revenue transparency, mercury use, child labor and other environmental and social safeguards. As the financial analyses below indicate, the activity itself can be made financially sustainable with modest investment in adaptable mining and processing equipment and better guidance in the geology of the ore body. Considering the scale of individuals involved in ASM in the country, the transformation of this activity into a regulated, environmentally sound economic occupation in rural areas will contribute significantly to the reduction of rural poverty.
3. The economic and financial appraisal of the AF was guided by an analysis of the socio-economic return of financial and technical support to artisanal mines and a model semi-mechanized small-scale mine. The figures are derived from sample surveys done under the Original Project and further figures drawn from Tanzanian experiences in developing semi-mechanized small-scale mines.

### *Socio-economic returns of support to artisanal mining*

4. The ASM baseline survey analyzed the effect of investment in machinery and equipment on miners' income. The survey compared three of the seven ASM areas selected for support under the Additional Financing. As seen in Table 1 below, investment costs vary by area and by type of deposit. The table demonstrates that ore grade and mineralogy is a critical factor in determining miner's income. For instance, the mines in Geita produce the least volume of ore per month because of higher grades. However, because of the complexity of the mineralogy which determines the easiness of extracting gold from the ore, the bag of ore in Geita commands lower price than in Tarime because of the implied lower recovery associated with the existing artisanal processing method. The second determining factor on miner's income is the business structure of the operation. Even though the Geita mines contain high-grade ores, the introduction of shareholder incomes (village councils for instance) means that miners have to share earnings with more people, and therefore end up with less income than the two other sites, but the socio-economic benefits are better distributed compared to Tarime or Chunya mines.

5. Finally, productivity has a direct impact on miners' income. For instance, Tarime miners face low-grade mines with the lowest gold yield per bag of ore, but they overcame this disadvantage by committing the largest capital investment per pit to achieve productivity gains. The capital investment is an average of 9 million Tsh per pit in Tarime, compared 5.25 million Tsh for Geita and 6 million Tsh for Chunya. Because of capital investment, productivity in Tarime is five times higher than in Geita and 2.5 times higher than in Chunya. As a result, income per miner is almost 3.5 million Tsh in Tarime compared to 2.2 million Tsh in Chunya and 1.9 million Tsh in Geita. As the examples of Geita and Tarime have shown, individual miner's incomes translate into higher rural incomes which can have significant multiplier effects though linkages with other economic sectors in rural areas. The results are summarized in Table 2 below.

**Table 1: Average investments and returns for artisanal mining (pit owners)**

	<b>Tarime</b>	<b>Geita</b>	<b>Chunya</b>
<b>Mining (monthly production)</b>			
Average Number of miners / pit	15	15	16
Investment/working capital , Tsh	9,000,000	5,250,000	6,000,000
Monthly Production (sacks of ore)	538	100	200
Production (grams of gold /sack of ore)	3	20	7
Selling price/ sack of ore, Tsh	150,000	50,000	40,000
Income, Tsh	80,700,000	100,000,000	56,000,000
<b>Gross profit, Tsh</b>	<b>71,700,000</b>	<b>94,750,000</b>	<b>50,000,000</b>
Shareholders income, Tsh	-	37,900,000	-
Owner's income (30%), Tsh	21,510,000	28,425,000	14,000,000
Miners overall earnings/ share (70%), Tsh	50,190,000	28,425,000	6,000,000
<b>Income share for each miner, Tsh</b>	<b>3,346,000</b>	<b>1,895,000</b>	<b>2,250,000</b>

Source: Baseline Survey of Artisanal and Small-Scale Mining, Ministry of Energy and Minerals, 2014

6. By supporting ASM Centers of Excellence and demonstration facilities, the AF will promote investment in productivity-enhancing techniques and equipment which could improve recoveries, and consequently the income of miners. Geological surveys and prospecting of the demarcated areas will define the nature and extent of the ore, facilitate more accurate resource and reserve estimates, and guide the preparation of mining plans which focus on following the veins over longer periods of time. By shifting the ASM cycle from a short-term activity focusing on the visible easy-to-extract ore, to a long term mining plan guided by geological knowledge of the direction, depth, and size of the mineralized veins, ASM operators will be more inclined to act as small and medium-scale mining businesses with a long term view.

#### *Socio-economic returns of support to semi-mechanized small-scale mining*

7. The scenario presented here is from the site of Lwamgasa, one of the sites appraised for the Additional Financing. The input parameters of the financial and economic analysis are derived from the available geological data, existing gold mining operations in the area and mine design parameters. The ore mine reserve used for the economic analysis is 33,167 metric tons averaging 3 grams of gold per one tone of mined ore. This reserve is based on sampling of ore deposit segment within a depth of 50 meters and a strike of 100 m long, along the mineralization.



Since the near-surface ore has been depleted by artisanal mining in previous years, the present model is based on the mine-owners investment in an underground small-scale mine. The underground mine will consist of a 3 x 2 m production shaft with a depth of 50 m. The equipment consists of a hoisting winch with a carrying capacity of 1.5 metric tons of raw ore. Estimated production capacity is 720 metric tons of ore per month. This capacity will be doubled in a second phase with new mine drifts. The other set of equipment include a modular processing plant using mercury-free processes. The plan comprises a single jaw crusher, a hammer mill, a centrifugal concentrator, and a shaking table. The plant capacity is 2 to 3 metric tons of ore per hour with a recovery rate of 60 percent. The analysis is based on the following assumptions:

**Table 2: Technical and Financial Assumptions**

Capex (US\$ thousand )	300.00
Estimated resources (metric tons)	33,167.94
Average ore mined (metric tons/month)	720.00
Average Ore milled/treated (metric tons/month)	1,080.00
Head grade (gm/t)	3.00
Average ore recovery (%)	60%
Price (US\$/gm)	37.05
Overall operating cost (US\$/month):-	17,780.00
Fuel (US\$/month)	5,280.00
Consumables (US\$/month)	3,000.00
Labor (US\$/month)	6,500.00
Administration (US\$/month)	3,000.00
Royalty (%)	4%
Local Government Levy (%)	0.30%
Corporate Income tax (%)	30%
Depreciation factor	0.73
Interest rate (%)	0.00
Life of Mine (months)	30.71
Depreciation time (months)	60.00
Discount rate (%)	7.82%

8. Based on these assumptions and calculations from a simple financial model of a small mine, the cumulative discounted cash flows of US\$128,687.09 are generated during the first 10 months of production. A capital investment of US\$300,000 used to purchase modern small-scale mining and processing equipment and the cost of mine development would pay itself in 23.4 months, or a little less than two years. During the first 10 months, the project will generate

US\$18,150.35 in royalties, a local government levy of US\$ 1,361.28, and corporate taxes of US\$76,980.92.

9. The project will generate US\$ 458,758.76 of rural revenues during the first 10 months of operation, with a potential to profoundly transform the local economy of Lwamgasa village. The village cooperative who owns the project will generate a sustainable income for the life of the mine. More than 60 local youth workers who previously engaged in unsafe and unregulated artisanal mining will secure permanent employment from the mine. In addition, the project will offer stable market for local service providers in form of goods and services for years to come. The project's model mine and centralized processing will have a demonstration impact which could accelerate the adoption of its production model by ASM entrepreneurs throughout Tanzania. The environmental impact of land degradation and mercury contamination will be significantly curtailed.