Appendices

Appendix 1 Questionnaires

Assessment of the safety and health of workers and the relevant Occupational Safety & Health Management Syst	em
in the Informal Sector: A Case of Artisanal and Small Scale Gold Mining in Zimbabwe and Uganda.	

SiteDateDate.	
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Section 1: General Worker Information							
1.Gender	\square_1 Female \square_2 Male						
2. Age	\square_1 18–35 \square_2 36–50 \square_3 >50 \square_{777} Other Specify						
3.Highest level of education	\Box_1 No formal school \Box_2 Primary \Box_3 Secondary \Box_4 Tertiary \Box_5 Vocational \Box_{777} Other Specify $\underline{}$ \Box_{999} Refuse to answer						
4. Knowledge and competence of your work in artisanal mining	\Box_1 Low \Box_2 Average \Box_3 High \Box_{777} Other Specify \Box_{888} Don't Know \Box_{999} Refuse to answer						
5.Marital status	\Box_1 Single \Box_2 Married \Box_3 Separated \Box_4 Divorced \Box_5 Widowed \Box_{999} Refuse to answer						
6. Household size (Number of people staying within your family)	\Box_1 1 \Box_2 2-5 \Box_3 More than 5 \Box_{777} Other, Specify $\phantom{aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa$						
7. Which assets have you owned through ASGM	\Box_1 Television \Box_2 Car \Box_3 Radio \Box_4 Bicycle \Box_5 Smart phone \Box_6 House \Box_{777} Other, Specify $\underline{\hspace{1cm}}\Box_{999}$ Refuse to answer						
8.Monthly household income	\square_1 100 USD and less \square_2 100-500 USD \square_3 500USD-1000 USD \square_{777} Other, Specify \square_{789} N/A \square_{888} Don't Know \square_{999} Refuse to answer						
9. Have you moved and worked in different mining sites in the past 6	\square_0 No \square_1 Yes \square_{789} N/A \square_{999} Refuse to answer If yes, please indicate why						

10. Which department do you work in?	\square_1 Digging \square_2 Blaster Blasting Licence \square_0 No \square_1 Yes \square 777 Other, Specify					
	\square_3 Lashing \square_4 Washing \square_5 Carrying/moving mined ore to the surface					
	\square_6 Loading/off when transporting ore to the stamp mill \square_7 Sponsor					
	\square_8 Manager/Supervisor/Gang leader \square_9 Working at the Stamp Mill \square_{10} Mine Owner					
	\square_{11} Amalgam burning \square_{12} Cooking \square_{13} Carrying ore manually to the stamp mill					
	☐ 14 Gold buying					
	\square_{777} Other, specify $\underline{\hspace{1cm}}\square_{888}$ Don't Know $\underline{\hspace{1cm}}\square_{999}$ Refuse to answer $\underline{\hspace{1cm}}\square_{789}$ N/A					
	a) Do you work underground? \Box_0 No \Box_1 Yes \Box_{789} N/A \Box_{888} Don't Know \Box_{999} Refuse to					
	answer b) If yes do you work alone?					
	c) How many hours do you work in a day? □₁ 1-8 □₂ 9-16 □₃ 17-24 □ ₈₈₈ Don't Know □ ₉₉₉ Refuse to answer					
	d) What kind of working arrangement do you have □ ₁ Salary □ ₂ Shares □ ₃ Contractor □ ₇₇₇ Other, specify □ ₈₈₈ Don't Know □ ₉₉₉ Refuse to answer					
11. How long have you worked in artisanal and small scale gold mining?	$\Box_1 1$ −5 years $\Box_2 6$ −10 years $\Box_3 11$ −15 years $\Box_4 > 15$ \Box_{789} N/A \Box_{666} Don't Remember \Box_{999} Refuse to answer					
12a) Do you know of HIV/AIDS test center	\square_0 No \square_1 Yes \square_{789} N/A \square_{888} Don't Know \square_{999} Refuse to answer b) Have you ever taken HIV test?					
close to your work place	\square_0 No \square_1 Yes \square_{789} N/A \square_{888} Don't Know \square_{999} Refused to answer					
	c) If yes and you are comfortable, may you share your status? \square_0 Negative \square_1 Positive \square_{789} N/A \square_{888} Don't Know					
	\square_{1010} Uncomfortable to answer					
13a) Have you ever	\square_0 No \square_1 Yes					
experienced any health	b) If yes, please specify,					
problems, became sick or got injured because of	\square_1 Respiratory problem \square_2 Memory problems \square_3 Skin problems					
mining activities?	\square_4 Reproductive problems \square_5 Hearing problems \square_6 Musculoskeletal					
	Problems \square_7 Kidney problem \square_8 Sight problems \square_9 Digestive problems \square_{10} Stress					

	$□$ ₁₁ Injury $□$ ₇₇₇ Other Specify $_$ _ $□$ ₇₈₉ N/A $□$ ₈₈₈ Don't Know $□$ ₉₉₉ Refuse to answer
14. How would you rate yo state	our health today from 1 to 100? 1 is the worst 100 is the best health
Section 2 Occupational Safety	
15. Who is responsible for safety on your site	\Box_1 Mine Owner (on site) \Box_2 Supervisor \Box_3 Gang leader \Box_4 Employee \Box_{777} Other Specify \Box_{789} N/A \Box_{888} Don't Know \Box_{999} Refuse to answer
16a) Have you ever had safety issues at your workplac e	□₀ No □₁ Yes b) If yes, in which department/area? □₁Going down to the mine/returning to the ground □₂Excavation □₃ Blasting □₄Lashing □₅Crushing □₆Removal of ore from shafts □¬Milling □₆Sluicing □ȝLoading, carrying of ore to the mill and off loading □₁₀Amalgam burning □₁₁Delivery and selling of gold □₁₂Acquisition and delivery of equipment and chemicals □₁₃Storage of equipment and chemicals □₁₄Disposal of waste □¬¬¬Other, specify □¬¬¬Other, specify □¬¬¬¬Other, specify □¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
17. When an accident occurs at work how is it handled?	\square_1 Reported to area chief \square_2 Reported to County Director of Mines \square_3 Reported to Country Commissioner \square_4 Not reported \square_5 Reported to the hospital \square_{777} Other Specify
	\square_{789} N/A \square_{888} Don't Know \square_{999} Refuse to answer
18. What actions are	\Box_1 Investigation into the cause \Box_2 Temporary Mine closure \Box_3 None \Box_{777} Other, specify $\underline{}_{789}$ N/A \Box_{888} Don't Know

normally taken after an accident?	□999 Refuse to answer
19 a). Have you ever been injured in the course of your work?	\Box_0 No \Box_1 Yes b) If yes, what was the type of injury? \Box_1 Cuts \Box_2 Fractures \Box_3 Bruises \Box_4 Back/Chest injuries \Box_{777} Other, specify \Box_{789} N/A \Box_{666} Don't Remember \Box_{999} Refuse to answer
20a). What was the cause of the injury?	□¹ Struck / hit by rock □² Sharp (rock) edges □₃ Fall □⁴Vibration □⁵Working tools/Machinery □⁶Lifting heavy load □¬Awkward posture □¬¬¬ Other, specify□¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
21a). Have you ever heard about	No □ ₀ Yes□ b) If yes, where did you get the information? □ ₁ Fellow miner □ ₂ Mine Site Manager □ ₃ Radio / TV □ ₄ Friend / Family □ ₅ Social media (Facebook / Twitter)

workplac e safety and health?	$□_6$ Newspaper / Magazine $□_7$ Training $□_7$ 789 N/A $□_{777}$ Other, specify $□_{666}$ Don't Remember $□_{999}$ Refuse to answer
22. a) Do you use personal protectiv e equipme nt (PPE) when working ?	No □₀ Yes□₁ b) If yes, which PPE? □₁ Helmets □₂ Protective footwear □₃ Protective glasses /face masks □₄ Protective clothing(jackets) □₅Ear protection □₆ Dust mask □¬Respirators □₆Protective belt □₆Sunhat □₁₀Raincoats □¬¬¬¬ Other, specify □¬¬¬¬ Other, specify □¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
	e) What are the common reasons for not using Personal Protective Equipment? \Box_1 Not provided \Box_2 Not required \Box_3 Not comfortable \Box_4 Not affordable \Box_5 Not aware of their importance \Box_{789} N/A \Box_{888} Don't Know \Box_{777} Other, specify \Box_{999} Refuse to answer
23. Have you ever experienced a case(s) of violence related to your work?	□ ₀ No Yes □ ₁ □ ₈₈₈ Don't Remember If yes, what kind of violence □ ₁ People taking over shafts by force □ ₂ Raiding of ore, gold, equipment etc. □ ₃ Physical attacks □ ₄ Fights at work □ ₅ Gender based violence □ ₇₇₇ Other [Specify]
23a) Have you ever been trained on OSH and/or first aid?	OSH \Box_0 No Yes \Box_1 First Aid \Box_0 No Yes \Box_1 b) If yes, who was the trainer? \Box_1 Mine /Site Manager(supervisor) \Box_2 Safety expert \Box_3 Workmate \Box_4 NGO \Box_{777} Other, Specify \Box_{789} N/A \Box_{999} Refuse to answer \Box_1 Occupational Safety and Health training \Box_2 Financial support
24. Which	

services do	\square_3 Mining services \square_4 Shops with PPE \square_5 Health Care						
you have	\square_6 Social security \square_7 Emergency Services \square_8 Competitive gold markets						
	\square_9 Schools \square_{10} Partnerships/Associations						
access to	\square_{11} Communication Specify $\square_{\text{TELEPHONE}}$ \square_{RADIO} $\square_{\text{TELEVISION}}$						
	9 NEWSPAPER SOCIAL MEDIA COMMUNITY GATHERINGS						
	\square_{777} Other services, Specify \square_{789} N/A \square_{888} Don't Know						
	Services, specify Services, sp						
25 What do you							
25. What do you consider the priority	\square_1 Dust \square_2 Noise \square_3 Flooding \square_4 Injuries/accidents \square_5 Hot						
safety and health issues	confined shaft						
at your work place?	\square_6 Workplace Violence \square_7 Muscle and back pain \square_8 Explosive fumes \square_9						
at your work place:	TB						
	\square_{10} HIV \square_{11} Mercury burning \square_{12} Malaria \square_{13} Snakes \square_{14} Hunger						
	\square_{15} Diarrheal diseases \square_{16} Heat Stress \square_{17} Cyanide \square_{777} Other, Specify						
	213 2 million diseases 210 feet Suess 21/2 juille 2///Other, Specify						
	\square_{789} N/A \square_{888} Don't Know \square_{999} Refuse to answer						
Section 3 Standard Oper	ating Procedures						
26 . Do you have specific	\square_0 No \square_1 Yes $_{888}$ Don't Know						
ways of working safe	If yes, please list them						
before during or after	here						
when performing							
activities like entering the							
mining pit, drilling,							
working with explosives lashing after blasting with							
explosives, manual							
lifting or carrying heavy							
loads, burning amalgam,							
milling or tanks/							
cyanidation							
Section 4. Gendered Chal	lenges						
27. Would you indicate	Prospecting (prospector/sampler) □ Male □ Female □						
roles for men and women	Both						
in the following activities	Digging □ Male □ Female						
Male	□Both						
Female	Drilling ☐ Male ☐ Female						
Both	□Both						
	Blasting □ Male □ Female						

	□Both Lashing		□ Male	☐ Female	
	Both				
	Transportation of ore		□Male	\Box Female	
	Both		= > 6 1	·	_
	Crushing		☐ Male	□Female	
	Both		- M 1	- F 1	
	Milling		☐ Male	☐ Female	
	Both		□ M-1-	□ Б1.	
	Sluicing □ Both		□ Male	☐ Female	
			□Male	☐ Female	
	Washing/Panning Both		□Male	□ remaie	
	Amalgamation		☐ Male	☐ Female	
	Both		_ iviaic		
	Cyanidation		□ Male	☐ Female	
	□ Both		_ 1.1.1.0		
28. Are there workplace	$Men \qquad \Box_0 No$	$\Box_1 Yes$	W	omen □ ₀ No	\Box_1
challenges/difficulties	Yes		VV		□1
common for men or	If yes, please specify:				
women at your work?	Men_				
women at your work.	141011				
	If yes, please specify: W	Jomen			

Appendix 2 Hazard identification and risk assessment tool [24.25]

Hazard Identification & Risk Assessment

Item	Hazard identified	Associated risk related	Probability index	Severity index				Frequency index	Risk score	Risk value
	identified	to hazard	mucx	I	P	E	C	mucx		

I: Injury
P: Impact of risk on production
E: Impact of risk on the work environment
C: Associated Cost of the risk

Appendix 3 Weighted Risk matrix of 1-5 based on probability; the severity on injury/diseases, the severity on production, the severity on the environment, the severity on cost; and frequency; modified after Basgen and Baudeee et al. 23,24

	Severity	Severity	Severity	C		
Probability Index	Injury/Disease (I)	Production P	Environment E	Severity Cost (C)	Frequency	
(5) Very high	(5) Fatal	(5) No production (Loss of > month)	(5) Permanent effects	Very expensive	(5) Hazard permanent Present	
(4) High	(4) Permanent to slight disability	(4) Loss of > 1 week to 1 month	(4) Long term > 2 years	Expensive	(4) Hazard arises weekly	
(3) Moderate	(3)> 14 Days recovery	(3) Loss of 1 week	(3) Medium > 6 months to 2 years	Average	(3) Hazard arises monthly	
(2) Minor	(2) Medical attention full recovery<14 days	(2) Loss of 1 day	(2) Short term 1 day to 6 Months	Cheap	(2) Hazard arises yearly	
(1) Unlikely	(1) First aid only	(1) Loss of 1 shift	(1) Insignificant effect	Very cheap	(1) Hazard arises in 5 years	

Appendix 4 Focus Group discussion questions

Focus Group Discussion: Men and women ASGM miners

- 1. a) Do you have knowledge of relevant Acts and Regulations on OSH?
 - b) What do you know about health and safety at work?
- 2. a) Could you share your experiences with accidents at work?
- b) From your experience how many days have you lost at work because of accidents?
- c) How are you and your families affected by these accidents?
- d) How is your production and earnings affected by such accidents?
 - 3. In the above context
 - i. Would you say it is necessary to protect your health and safety?
 - ii. Which safety and health practices do you have?
- iii. How do you burn amalgam (retort, open in the air, at home under closed doors?
- iv. How do you store mercury and the equipment and PPE/clothes you use when burning amalgam?
- v. Which measures do you usually follow during blasting?
- vi. Which measures do you usually follow during cyanidation?
- vii. Which measures do you usually follow when using equipment?
- viii. Which measures do you usually follow when developing mining pits and mining?
- ix. Where do you get water to drink during working hours?
- x. Are you able to use toilets during working hours?
- xi. What is the culture on changing the hoist rope?
- xii. Which aspects of safety practices do you think needs improvements at your work? Please explain.
 - 2. What is the health and safety issues affecting women in ASGM?
 - **3.** How is the health of your family and children affected by your involvement in ASGM?
 - a) Have you ever had a disabled child/child with slow development since you started working in artisanal small scale gold mining?
 - **b)** What are the issues affecting women and children at your workplace?
 - c) Is your sexual life affected by your work?
 - **4.** a) Do you think it is necessary/ useful to have safety and health management a work?
 - b) If so, please explain.
 - c) If no, please explain.
 - **d)** Who should be responsible for the management of health and safety in the informal sector?
 - **5.** Do you think it is possible to extract gold without mercury (mercury free technology) at your work to protect the health of the workers?
 - **6.** What are the common perceptions on mercury use and the management of safety and health (mercury use/ mercury free technology, shaft requirements)?
 - Explosives and blasting requirements, PPE etc.) at your work
 - 7. What do you think are the existing gaps and challenges in managing workplace safety and health at your site (reducing mercury use/ mercury free technology, requirements on shafts, explosives, blasting, fire extinguishers, first aid, PPE)?
- 8. a) What do you think are the factors/issues to address to improve management of OSH in the informal sector e.g., ASGM?
 - **b)** What do you think are the factors/issues to address to improve the compliance to relevant regulations on OSH in the informal sector (ASGM)?

- **9.** What are your suggestions on managing safety and health in artisanal and small scale gold mining (mercury use/mercury free technology, shaft requirements, explosives and blasting requirements, PPE etc.?
- Would you say the same safety and health regulations in large mines could be applied to artisanal and small scale mines to improve the safety and health of workers in ASGM?
- 10 a) Would you explain how your work was affected by the coronavirus pandemic?
 - b) What challenges did you face on the management of your health and safety at work during the corona virus pandemic?
 - c) What is needed for your workplace to be able to recover from the impacts of Corona Virus?
 - d) What do you suggest to be done for OSH management in terms of disaster preparedness and response in ASGM for emerging infectious diseases such as the Corona virus?
- 11. Where do you see Artisanal Gold Mining in communities in relation to climate change challenges such as drought?
 - 2. a) Do you have knowledge of relevant Acts and Regulations on OSH?
 - b) What do you know about health and safety at work?
 - 2. a) Could you share your experiences with accidents at work?
 - b) From your experience how many days have you lost at work because of accidents?
 - c) How are you and your families affected by these accidents?
 - d) How is your production and earnings affected by such accidents?
 - 3. In the above context
- xiii. Would you say it is necessary to protect your health and safety?
- xiv. Which safety and health practices do you have?
- xv. How do you burn amalgam (retort, open in the air, at home under closed doors?
- xvi. How do you store mercury and the equipment and PPE/clothes you use when burning amalgam?
- xvii. Which measures do you usually follow during blasting?
- xviii. Which measures do you usually follow during cyanidation?
- xix. Which measures do you usually follow when using equipment?
- xx. Which measures do you usually follow when developing mining pits and mining?
- **xxi.** Where do you get water to drink during working hours?
- xxii. Are you able to use toilets during working hours?
- **xxiii.** What is the culture on changing the hoist rope?
- xxiv. Which aspects of safety practices do you think needs improvements at your work? Please Explain
 - 2. What is the health and safety issues affecting women in ASGM?
 - 3. How is the health of your family and children affected by your involvement in ASGM?
 - d) Have you ever had a disabled child/child with slow developme
 - e) nt since you started working in artisanal small scale gold mining?
 - f) What are the issues affecting women and children at your workplace?
 - g) Is your sexual life affected by your work?
 - **4.** a) Do you think it is necessary/ useful to have safety and health management a work?
 - **b)** If so, please explain
 - e) If no, please explain
 - f) Who should be responsible for the management of health and safety in the informal sector?

- 5. Do you think it is possible to extract gold without mercury (mercury free technology) at your work to protect the health of the workers?
- **6.** What are the common perceptions on mercury use and the management of safety and health (mercury use/ mercury free technology, shaft requirements)?
 - Explosives and blasting requirements, PPE etc.) at your work
- 7. What do you think are the existing gaps and challenges in managing workplace safety and health at your site? (reducing mercury use/ mercury free technology, requirements on shafts, explosives, blasting, fire extinguishers, first aid, PPE
- 8. a) What do you think are the factors/issues to address to improve management of OSH in the informal sector e.g. ASGM
 - **b)** What do you think are the factors/issues to address to improve the compliance to relevant regulations on OSH in the informal sector (ASGM)?
 - **9.** What are your suggestions on managing safety and health in artisanal and small scale gold mining (mercury use/mercury free technology, shaft requirements, explosives and blasting requirements, PPE etc?
 - Would you say the same safety and health regulations in large mines could be applied to artisanal and small scale mines to improve the safety and health of workers in ASGM
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 - e) What challenges did you face on the management of your health and safety at work during the corona virus pandemic?
 - f) What is needed for your workplace to be able to recover from the impacts of Corona Virus?
 - g) What do you suggest to be done for OSH management in terms of disaster preparedness and response in ASGM for emerging infectious diseases such as the Corona virus?
- 11. Where do you see Artisanal Gold Mining in communities in relation to climate change challenges such as drought?

Appendix 5: In-depth interview questions

Describe your usual working day What are your health needs at work	Describe what could be dangerous to your health at your workplace	Which PPE do you have at your workplace	Would you use PPE if you had a choice	What are the challenges with using PPE	What is the impact of mining on your health and your daily life	Possible health interventions
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