

Capability of Social Life Cycle Assessment for Analyzing the Artisanal Small-Scale Gold Mining Sector – Case Study in the Amazonian Rainforest in Brazil

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Guideline for interviews with stakeholders during field trips

Table 1: Guideline for interviews with stakeholders during field trips

Social Category	Sample questions for workers	Sample questions for mine owner	Sample questions for other involved people
Freedom of Association and Collective Bargaining (Benoît and Mazijn 2009)	Did you hear about an association/club or society that was founded by Garimpeiros?		
Child Labour (Benoît and Mazijn 2009)		Do you keep record about the age of your workers?	
	Does a child have to work less compared to other workers? (e.g. carry less weight, less hours?)		
	Did it happen that children came here and wanted to work?	How old are the children who work here?	From which age are children responsible to contribute to the family's income?
Fair salary (Benoît and Mazijn 2009)	How high is your wage/ the percentage of the gold produced you receive?		
		How do you determine the height of the wages? Do they change?	
Working hours (Benoît and Mazijn 2009)	How many hours a day do you work? How many days a week?		
	How many days of holiday do you have per year?		
	Are you working here the whole year or on a temporary basis? What else do you do?		
	Do you get paid "hora extra" if you work more?		

Forced Labour (Benoît and Mazijn 2009)	Did you hear about people who were forced to work by a mine owner?		
Equal opportunities/ discrimination (Benoît and Mazijn 2009)		What are the requirements to be able to work here?	
	Are people working here which have different religions, races or political views?		
	Are there men and women working here? Why are there no women?		
Health and safety (worker) (Benoît and Mazijn 2009)	How many fatal and nonfatal accidents happen each year?		
	Is safety equipment provided? Who pays for it? (e.g. helmets, gloves, breathing mask)		How many people have injuries from accidents with machines?
	If you see that the tunnel/pit is not stable and could collapse, what do you do?		How many people have injuries from earth collapses?
	What would have to change to avoid bad influences of mercury?		How many people are suffering from mercury impacts?
Social benefits and security (Benoît and Mazijn 2009)	If a worker had an accident and has to go to the doctor or take medicine, who pays for it?		
	If a worker had an accident and cannot continue working, will he still receive his money for the time he worked here?		
	If a person is old or sick and cannot work because of that, how do they make a living?		
Access to material resources (Benoît and Mazijn 2009)		Are there any actions in place to protect the forest and/or water or other natural resources?	
Access to immaterial resources (Benoît and Mazijn 2009)		If you need money/ a credit, where do you get it from?	
Delocalization and Migration (Benoît and Mazijn 2009)	Did you have to migrate to be able to work here?	Have there been people living here which had to be delocated?	
	How often do you change your location?		
Cultural Heritage (Benoît and Mazijn 2009)	Are there actions to protect cultural heritage?		
Safe & healthy living conditions (Local community) (Benoît and Mazijn 2009)			Are you affected by the Garimpos in terms of secure and healthy living conditions?

Respect of indigenous rights (Benoît and Mazijn 2009)	Are there conflicts with indigenous people?		
		What happens if you want to mine at a place where indigenous people are living?	
Community engagement (Benoît and Mazijn 2009)		Do you make any engagements for the (local) public?	
Local employment (Benoît and Mazijn 2009)		Is everyone who comes by allowed to join the work?	
Secure living conditions (Benoît and Mazijn 2009)	Are weapons still around?		
Public commitments to sustainability issues (Benoît and Mazijn 2009)	What is done by the government to protect the rain forest?		
Contribution to economic development (Benoît and Mazijn 2009)		Are you involved in any research activities?	
		Do you invest in the village or other infrastructure over here?	
	What happens to the sold gold, how and where does it get processed afterwards? (e.g. jewelry, electronics)		
	Is there a chance that you process the gold further? (e.g. jewelry)		
		Would you employ more people?	
Prevention & mitigation of armed conflicts (Benoît and Mazijn 2009)	see secure living conditions		
Technology Development (Benoît and Mazijn 2009)	Clean and more secure technologies (e.g. machines) are available. Would you prefer using them?	Are you involved in research or the development of technology?	
Corruption (Benoît and Mazijn 2009)	Have you ever come across corruptive actions?		Have you ever come across corruptive actions?
Granted minimum price (ARM 2019)		Do you receive a guaranteed minimum price?	
Strengthened organization (ARM 2019)	Answered though state of legality and formality of mine	Are you part of an association and if not, did you consider doing so? Is there a chance to do it?	
Stable and long-term trade relationships (ARM 2019)		What kind of relationship do you have with your suppliers?	
Legality and formalization (ARM 2019)	Answered though state of legality and formality of mine		

Identity documents	Do you have identity documents?		
Personal Questions	What are your biggest worries or concerns?		
	What are your wishes for the future?		
	What do you like most about your work and life?		
	What was your previous job? Why did you leave it?		
Correlation world market	What happens of the price for oil increases?		
	What happens if the price for gold decreases?		
Risk	What happens if the car/plane/machine breaks down? Who bears the risks?		
Accommodation/Food	Do you feel save?	Do you provide accommodation and food for your workers? How?	
	Is there water and electricity?		
	Do you have to pay rent?		
Occupation	Do/did you have another job (before you came here)?	What was the highest amount of workers you ever had? And now?	
	What do you do if there is no place to work?		
	Do you have any other job or monetary income?		
	What would be an alternative job option for you?		
Money management	How do you spend your money? Is there a chance to save some of it?		
Education	Did you go to school? And your children?		
	If you want to read or write something, is there somebody who can help?		
	If you want to learn how to read and write, is there an option for this?		
Transportation infrastructure	How far is the next school or education institute?		
	How far is the next village/...?		
	How far is the next medical health institution?		

Table 2: Further development of guideline for interviews with stakeholders during field trips

Social Category	Sample questions for workers	Sample questions for mine owner	Sample questions for other involved people
Autonomy	Is it important for you to be free and autonomous and leave whenever you go or would you prefer having a stable job with a save income?		
Presence of the state	Would you wish more presence and regulation by the government?		
Alternative income opportunities	If you had the chance to grow and/or harvest fruits or vegetables, is there a chance to sell it?		
Extraction methods	How did work change with the appearance of excavators?		
Social insurance	Will you apply for retirement funds when work in the mine becomes too strenuous?	Retirement funds are entitled to everybody. Why make Garimpeiros no use of it?	

Social states and according SLCA categories

Table 3: Social states and according SLCA categories

Social state	SLCA categories ¹			
	UNEP/SETAC guidelines (Benoît and Mazijn 2009)	RPSM (Goedkoop et al. 2018)	SHDB (Benoit-Norris et al. 2012)	PSILCA (Eisfeldt and Ciroth 2017)
No presence of the state	-	-	-	-
Illegal and informal	-	-	Legal system	Legal issues
Organizational structure	Forced labor	Forced labor	Forced labor	Forced labor
	Delocalization and Migration	-	-	-

¹ For definitions of categories see corresponding sources

Bad working conditions	Working hours	Work-life balance	Excessive Working Time	Working Time
Unstable payment	Fair salary	Remuneration	Wage assessment	Fair salary

References

ARM (2019) The FAIRMINED Standard for gold. <https://www.fairmined.org/the-fairmined-standard/>. Accessed 24 Sep 2019

Benoît C, Mazijn B (2009) Guidelines for social life cycle assessment of products. UNEP.

http://www.unep.fr/shared/publications/pdf/DTIx1164xPA-guidelines_sLCA.pdf. Accessed 24 Sep 2019

Benoit-Norris C, Cavan DA, Norris G (2012) Identifying Social Impacts in Product Supply Chains: Overview and Application of the Social Hotspot Database. Sustainability 4(9):1946–1965. doi:10.3390/su4091946

Eisfeldt F, Citroth A (2017) PSILCA - A Product Social Impact Life Cycle Assessment database. Database version 2. Documentation, Version 3. <https://nexus.openlca.org/ws/files/12765>. Accessed 05.02.19

Goedkoop MJ, Indrane D, Beer IM de (2018) Methodology for Product Social Impact Assessment, Amersfoort, Netherlands