
CAN MINING EVER BE TRULY ETHICAL?



Photo: © Ceylons Munich

Student project for Gemmology Diploma 2021/2022

Bruno Mojonner-Stingl

Student Number 818 657

Neugutstrasse 5

CH-8400 Winterthur, Switzerland

bruno@mojonner.ch

Total word count without appendix: 2227

Table of contents

Introduction.....	4
What is the meaning of ethics?.....	5
Current mining situation of gemstones - an overview.....	6
Short overview of current solutions.....	7
Responsible Jewellery Council (RJC).....	8
Code of Risk-mitigation for ASM engaging in Formal Trade (CRAFT).....	9
Smaller cooperations.....	10
Conclusion	11
Appendix.....	12
Initiative for responsible mining assurance (IRMA)	12
Responsible Minerals Initiative (RMI).....	13
Fairtrade International	14
Fairmined.....	15
The main SDG's in the context of ethical mining.....	19
The characteristics of Artisanal and Small-scale Mining	21
Acknowledgements	22
References	23

Introduction

Mining has a long tradition in human history and dates back to prehistoric times (Mining, 2021). 'Under mining, we understand activities for extracting ores or other mineral resources through mining operations, production facilities or smelters.' (Mines & history of mining, 2021). This includes, for example, coal, gas, oil, metals, but also gemstones, gravel, clay, and any material that cannot be grown or feasibly created artificially. In a wider sense, it includes the extraction of any non-renewable resource (Mining - Wikipedia, 2021).

These resources made it possible to build our modern lifestyle. Yet, everything we depend on is either made from minerals or relies on minerals for production and distribution. (A Brief History of Mining - Earth Systems, 2021).

Apart from these favourable properties, mining also has negative impacts like erosion, chemical and water pollution, deforestation, effects on biodiversity, human health problems, and other environmental and social problems (Hentschel, Hruschka and Prister, 2003).

Due to the complexity of the mining sector and the size of this work, this report focuses on a small part of the mining industry, namely the mining of coloured gemstones, which is part of the jewellery sector.

This sector, which is heavily dependent on mining, has been relatively late in realising the inherent obligation for and the opportunities in pursuing and promoting sustainable development (Cartier, 2020).

Jewellery consumers are increasingly aware of the negative impacts of mining. As a result, they are interested in knowing where and how the gemstones and jewellery they purchase are mined and manufactured. (SUSTAINABLE LUXURY CONSUMER REPORT 2021, 2021).

The first part of this report deals with the different definitions and gives an overview of the current mining situation focusing on ASM and coloured gemstone mining.

The second part gives an overview of current solutions for more ethical mining and their implementation success.

This report is based on internet research and interviews with people active in this field.

What is the meaning of ethics?

The term ethics or ethical is defined as 'relating to moral principles or the branch of knowledge dealing with these'. Other explanations are 'morally good or correct' or 'avoiding activities or organisations that do harm to people or the environment.' (Definition of ETHICAL by Oxford Dictionary, 2021)

These definitions already show that ethics or ethical is a broad, personal, value-based, and subjective concept, which is hard to define (Cartier, 2020). Many questions arise in this context: Who is determining what is morally good or correct? For whom and in which context, something must be morally good or right? Is ethical the best term? The problem with 'ethical' is that it means something different for different people; there is no clear definition. Additionally, the plethora of words that have appeared in recent years to describe claims of ethical or good business conduct in production and sourcing of gems further highlight this challenge of communication and definition: sustainable, responsible, conflict-free, transparent, fair trade, development, conscious, traceable, clean, green, and ecological. (Cartier, 2020).

The term sustainable has become increasingly popular in recent years. The advantage of sustainable is that it has a more precise definition than ethical and can be measured. It started with the Brundtland (1987) report, which defined the term as 'Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future.'. Over the definition in early 2000 with its interdependent and mutually reinforcing pillars of economic development, social development and environmental protection (2005 World Summit Outcome, 2005) leading to the 2030 agenda for sustainable development adopted by all United Nations Member States in 2015. The agenda includes 17 sustainable development goals (SDG) with 169 targets to form a blueprint for peace and prosperity for people and the planet (THE 17 GOALS | Sustainable Development, 2015).

These goals and targets form a framework for sustainable mining and have already been implemented in several international recognised standard systems. However, the process of development of these goals over these years shows that the definition of sustainable development must consider three additional and essential aspects:

1. Continuous adaptation of the standard:

The definition of sustainable development (and ethical, too) is not stable and has to be redefined from time to time. (Brundtland, 1987)

2. Local adaptation of the standard:

Economic, social systems and ecological conditions differ widely among countries, and a single blueprint of sustainability does not sufficiently consider the local needs and conditions (Brundtland, 1987).

3. Substitutes and recycling:

As for non-renewable resources, like minerals, their use reduces the stock available for future generations. Sustainable development requires that the depletion rate of these resources should foreclose as few future options as possible (Brundtland, 1987). It implies for

the jewellery sector that substitutes for all kinds of natural gemstones should be available, and recycled 'old' gemstones will be necessary not to compromise future generations' needs and aspirations.

Current mining situation of gemstones - an overview

It is essential, to understand the current mining situation of coloured gemstones, to consider that at a production level, large-scale mining (LSM) largely dominates diamond mining, whereas artisanal and small-scale mining (ASM) is, by far, the primary source of coloured gemstones (Cartier, 2020).

ASM refers to mining by individuals, groups, families, or cooperatives with minimal or no mechanisation, often in the market's informal (illegal) sector (Hentschel, Hruschka and Prister, 2003). Today, ASM is the primary source of employment for at least 44.75 million people across 80 countries worldwide. However, it is largely a poverty-driven activity. In addition, the deposits are often small and in very remote locations; estimating the potential and reserve require technical expertise; the variation in size and quality make standardised pricing difficult, and they can be low volume but high value. This combination results in thousands of small producers connected through a network of traders and dealers with producers mining in very hazardous conditions, receiving a fraction of the market value, and undervalued informal exports to international markets where value is added (McQuilken and Perks, 2021).



Photo: © Ceylons Munich

Short overview of current solutions

During the last 20 years, several organisations have taken up the issue of mining and have worked out different solutions. A strong influence on the development of these solutions have normative frameworks like the OECD Due Diligence Guidance (OECD, 2016) and related instruments that encourage or require downstream actors to further understand and "derisk" their supply chains. (Alliance for Responsible Mining Standards Team, 2020)

The table below gives a short overview of the most known initiatives in the mining sector:

Organisation	Type of system	Implementation in the coloured gemstone mining sector possible?	Explanation
CRAFT - Code of Risk-mitigation for ASM engaging in Formal Trade (craftmines.org)	Open-source standard only	Yes	Very new system
RJC responsible jewellery council (responsiblejewellery.com)	Certification system	Yes	Internationally recognised system
Smaller cooperations (See below)	Strong partnership	Yes	Many successful examples
Fairtrade International (fairtrade.net)	Certification system	No	Only a standard for gold
Fairmined (fairmined.org)	Certification system	No	Only a standard for gold
RMI responsible minerals initiative (responsiblemineralsinitiative.org)	Certification system	No	Only for large-scale mining operations
IRMA initiative for responsible mining assurance (responsiblemining.net)	Certification system	No	Only for large-scale mining operations

As visible in the table above, only the RJC standard, the CRAFT standard, and the system of smaller cooperations are solutions that can be or are already implemented in the coloured gemstones sector. However, do these solutions fulfil the definition of sustainable gemstone mining? That means the SDG's and the two additional aspects of sustainable development, continuous and local adaptation of standards, are included:

Initiative / standard	Legality (OECD conformant)	Are SDG's implemented	Continuous adaptation of the standard?	Local adaptation of the standard?
CRAFT	yes	Only partly implemented	yes	no
RJC	yes	implemented	yes	no
Smaller cooperation	yes	Not clear if implemented	Not clear	Due to strong and close partnership, local adaptation is strong

Responsible Jewellery Council (RJC)

Founded in 2005, RJC is the world's leading standard-setting organisation for the jewellery and watch industry, with over a thousand members. Most of them are jewellery manufacturers, traders, cutters and retailers but only 14 diamonds, coloured gemstones and precious metals miners. The RJC has implemented two standards. First, the Code of Practices (COP) defines the responsible, ethical, human rights, social and environmental practices all certified RJC members must adhere to. Second, the Chain of Custody standard establishes an approach for companies to handle and trade their products and materials fully traceable and responsibly sourced (The RJC Vision • Responsible Jewellery Council, 2021).

Advantages:

- Relatively well known in the jewellery sector
- Builds on and supports international standards and development goals
- Requires third-party auditing

Disadvantages:

- Only the COP standard is mandatory for all members
- Not easy to implement due to the complexity of the two standards
- Compliance with several key international human rights instruments, auditing and certification, remain weak and opaque (Sparkling Jewels, Opaque Supply Chains, 2021).
- The COC standard covers only metal products and no gemstones

Examples:

Potentote Mining LLC, USA, Greenland Ruby A/S, Greenland, Capricorn Saphires Ptd Ltd, Australia. None of them has yet completed the COP and the chain of custody standard.

(Find an RJC Certified Member • Responsible Jewellery Council, 2021)



Photo: © Ceylons Munich

Code of Risk-mitigation for ASM engaging in Formal Trade (CRAFT)

The CRAFT code is a tool that supports artisanal and small-scale mining to start their journey towards responsible mining to empower them in understanding and complying with market expectations and due diligence needs. Developed in 2016, it is an open-source standard. Therefore, it may be freely used or incorporated in other certification systems, but it is not a certification system itself (Alliance for Responsible Mining Standards Team, 2020).

Advantages:

- Easier to be implemented in the ASM sector than other solutions
- A practical roadmap to formalisation
- Incentives to eliminate worst mining practices
- Access to formal supply chains
- More legitimacy of miners' activities

Positive change using a progressive improvement approach

Disadvantages:

- Very new and unknown

Examples:

Only six projects in Colombia, Honduras and Burkina Faso have been described on the craftmines.org website.



Photo: © Ceylons Munich

Smaller cooperations

During the last years, an increasing amount of cooperation's between partners from industrialised countries and small mining operations have been built. Here the degree of mechanisation, internal organisation and compliance with international industrial standards is advanced (ASM 2006). These cooperations are not focused on a certification system but are based on a strong and equal partnership between miners and different gems and jewellery industry partners. Many of these initiatives have been quite successful, especially with artisanal (ASM) mines, where progress has been made in many areas (Pool, 2021)

Advantages:

- Short and easy supply chains
- Strong, equal and often long partnerships build trust

Disadvantages:

- No 3rd party audits are confirming their claims
- No certification system
- No common standard

Examples:

It is the only 'system' with a growing number of examples like Brazil gems (aurhen.de), Moyo Gems (moyogems.com), Virtu Gem (virtugem.com), Columbia Gem House (columbiagemhouse.com), Fura gems (furagems.com), Agere Treasures (ageretreasures.com), Muzo (muzo.co), Anza Gems (anzagems.com), Gemfields (gemfields.com), Fuli Gemstones (fuligemstones.com), Miadana (miadana.de) and nineteen48 (nineteen48.com).



Photo: © Ceylons Munich

Conclusion

The term ethical mining is hard to define and has a broad range of meanings. Instead of ethical, the term sustainable is often used. It has a more precise definition and can be measured. Sustainability has three pillars: environmental, social, and economic. The 17 sustainable development goals (SDG) adopted by all United Nations Member States in 2015 are practical goals toward sustainability.

Many mining and jewellery initiatives have implemented these SDG in their systems toward more sustainable mining and business practices. However, because most of the coloured gemstones are sourced in the artisanal and small-scale mining (ASM) sector, which is often informal and very complex, only three systems were found who can be implemented in the coloured gemstones sector: RJC, CRAFT and the system of smaller cooperations.

CRAFT is the first step out of the informal sector but is still far away from sustainable mining. It does only fulfil the OECD Due Diligence Guidance requirements.

RJC has set up a complex and costly certifications system that fulfils most sustainability aspects and is close to sustainable mining. Still, some critical factors like compliance with several key international human rights instruments or auditing and certification remain weak and opaque (Sparkling Jewels, Opaque Supply Chains, 2021).

Another weakness of the CRAFT and RJC system is the lack of local customisation, as each mining country has its particular circumstances and requirements. Therefore, it is challenging to implement the same solutions in every country. There is no single system that works everywhere. They can be similar but not identical. (Pool, 2021)

Smaller cooperations are good examples of how cooperation can work on a locally adapted level and help develop towards sustainable mining. On the one hand, their communication is often open and personal, and the supply chains are short. This helps to build trust. However, on the other hand, it is unclear if they fulfil international accepted standards, and third-party certification to confirm their claims is missing.

It is still a long way towards sustainable mining for most miners. However, there are already some very well-established mining projects that are close to sustainable mining (i.e. Greenland Ruby A/S). That means that mining can be sustainable and possibly ethical, depending on the definition of that word. Nevertheless, it is crucial that anyone who claims to practice ethical mining also defines precisely what they mean by this.

Appendix

Initiative for responsible mining assurance (IRMA)

The idea of IRMA to drive positive change in industrial-scale mining using credible third-party certification has already been proven in industries such as forestry (FSC: Forest Stewardship Council) and fishing (MSC: Marine Stewardship Council). IRMA offers the only third-party certification of industrial-scale mine sites for all mined materials governed equitably by the private sector, local communities, civil society, and workers. It is the most comprehensive standard and is available now for mines all over the world.

What makes the IRMA system unique?

- IRMA is governed equitably by a diverse set of stakeholders. However, most standards created for mining are governed by industry alone.
- More than 60 civil society organisations and communities have recognised IRMA
- Unique decision-making process: No single organisation, company, or stakeholder sector has the authority to make decisions that do not work for other stakeholder groups.
- The Standard for Responsible Mining was developed through a public consultation process

Can the system be used for ASM in the coloured gemstone sector?

No, ASM is not in the scope of the IRMA system. It is focused only on large scale mining.

Responsible Minerals Initiative (RMI)

The Responsible Minerals Initiative (RMI) is one of the most utilised and respected resources for companies from various industries addressing responsible mineral sourcing issues in their supply chains. RMI is providing companies with tools and resources to make sourcing decisions that improve regulatory compliance and support responsible sourcing of minerals from conflict-affected and high-risk areas

What makes the RMI system unique?

- Flagship is the Responsible Minerals Assurance Process (RMAP) that offers companies and their suppliers an independent, third-party audit of smelter or refiner management systems and sourcing practices to validate conformance with RMAP standards and current global standards.
- more than 400 companies and associations from over ten industries participate
- Collaboration with other complementary programs and initiatives in this area
- Responsible Minerals Initiative Workshop for in-depth discussion and guidance on best practices on responsible mineral sourcing

Can the system be used for ASM in the coloured gemstone sector?

No, ASM is not in the scope of the RMI system. It is focused only on large scale mining.

Fairtrade International

Fairtrade International has developed a standard that applies to artisanal and small-scale mining organisations (ASMOs) in countries in the geographical region of Africa, the Middle East, Asia, Pacific, Latin America and the Caribbean, and traders buying and selling precious metals produced by ASMOs.

The overall objective of this standard is to create opportunities for artisanal and small-scale miners and their communities by promoting the formalisation of the artisanal and small-scale mining (ASM) sector through establishing membership-based artisanal and small-scale mining organisations (ASMO).

The aims are to improve working conditions for miners and strengthened mining organisations and their capacity to lobby for a range of improvements and benefits.

What makes the Fairtrade International system unique?

- The system focuses only on the ASM sector in some geographical regions
- Fairtrade is the most recognised and trusted sustainability label in the world. The global organisation is co-owned by more than 1.8 million farmers and workers.

Can the system be used for ASM in the coloured gemstone sector?

No. Although Fairtrade International focuses on ASM, there is only a standard for gold mining available now.

Fairmined

Fairmined is an assurance label that certifies gold from empowered, responsible artisanal and small-scale mining organisations.

Fairmined is backed by a rigorous 3rd party certification and audit system that ensures that artisanal and small-scale mining organisations meet world-leading standards for responsible practices, delivering organisational and social development and environmental protection.

The Fairmined Initiative was created by the Alliance for Responsible Mining (ARM), a non-profit organisation globally recognised as a leader and pioneer of responsible artisanal and small-scale mining.

What makes Fairmined unique?

- In 2009 based on Standard Zero, the first version of the Fairmined Standard was developed in partnership with Fairtrade International
- Fairmined Ecological Gold is produced under the same strict standard for responsible mining as Fairmined Gold in terms of social, organisational and economic criteria. Although Fairmined Gold is produced with responsible management and reduction of toxic chemicals like mercury and cyanide, miners producing Fairmined Ecological Gold do not use any toxic chemicals at all in their extraction processes.

Can the system be used for ASM in the coloured gemstone sector?

No. Although Fairmined focuses on ASM, there is only a standard for gold mining available now.

Comparing different (certification) systems in the mining and the forestry sector

Institution/System	The focus of the system	Scope	Chain of Custody system	3 rd party certification	Applicable for ASM	Standards	Standard development system	Comply with ISEAL	Local adaptation	Human rights watch opinion
Fairtrade International	ASM	ASM to retailer	Yes	yes	yes	Gold standard	Multi-Stakeholder process	yes	no	Positive: rigour of the requirements regarding human rights, the environment, and traceability. Weaknesses: have gaps in their certification processes and lack robust public reporting requirements.
Fairmined	ASM	ASM to retailer	Yes	yes	yes	Gold standard, Ecological Gold standard	Multi-Stakeholder process	no	no	Positive: rigour of the requirements regarding human rights, the environment, and traceability. Weaknesses: have gaps in their certification processes and lack robust public reporting requirements

Institution/System	The focus of the system	Scope	Chain of Custody system	3 rd party certification	Applicable for ASM	Standards	Standard development system	Comply with ISEAL	Local adaptation	Human rights watch opinion
RJC responsible jewellery council	Wholesaler, producer	Mine to market	(yes)*	yes	yes	Code of practices 2019 Chain of Custody 2017	Multi-Stakeholder process	yes	no	Positive: align with OECD Minerals Guidance, transparency improved Weaknesses: does not require compliance with several key international human rights instruments, does not require companies to establish full traceability for their material. auditing and certification remain weak and opaque
OECD Minerals guidance	Risk mitigation	Market chain	no	no	no		Multi-Stakeholder process	no		
RMI responsible mining initiative	smelters and refiners	smelters and refiners	no	yes	no	standards for smelters and refiners	the standards development process includes public consultation on any major revisions.	no	no	
IRMA initiative for responsible mining assurance	mining	LSM	Yes (Draft version only)	yes	no	Standard for LSM	Multi-Stakeholder process with on-field testing	yes	No	Positive: IRMA's reporting requirements may provide more transparency than most other standards

Institution/System	The focus of the system	Scope	Chain of Custody system	3 rd party certification	Applicable for ASM	Standards	Standard development system	Comply with ISEAL	Local adaptation	Human rights watch opinion
FSC (Forest stewardship council)	Forest certification	Forest owners to retailers	yes	yes	no	Forest certification standard	Multi-Stakeholder process	yes	Yes (only Forest standard)	Not available

The main SDG's in the context of ethical mining

Goal 8

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.3	Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro-, small- and medium-sized enterprises, including through access to financial services
Target 8.4	Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead
Target 8.5	By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
Target 8.7	Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms
Target 8.8	Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular, women migrants, and those in precarious employment
Target 8.a	Increase Aid for Trade support for developing countries, in particular, least developed countries, including through the Enhanced Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries

Goal 15

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
Target 15.2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally
Target 15.3	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
Target 15.5	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

Goal 12

Ensure sustainable consumption and production patterns

Target 12.2	By 2030, achieve the sustainable management and efficient use of natural resources
Target 12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment
Target 12.8	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

(THE 17 GOALS | Sustainable Development, 2015)

The characteristics of Artisanal and Small-scale Mining

(Hentschel, Hruschka and Prister, 2003)

- Lack of or limited use of mechanisation and a lot of physically demanding work
- Low level of occupational safety and health care. Today ASM is as unsafe as large-scale coal mining in the USA in the early 1970s (McQuilken and Perks, 2021)
- Child labour (McQuilken and Perks, 2021)
- Poor qualification of personnel at all levels of the operation
- Inefficiency in exploitation and processing of mineral production (low recovery value). Lack of geological and gemmological knowledge. This leads to inefficient mining technics and loss of revenue on sales.
- Human right abuses: For example, gems from Burma (Myanmar) have been subject to multiple government and company boycotts over the past decade and have been labelled blood rubies (2008) and genocide gems (2018), among other terms. (Cartier 2020)
- The exploitation of marginal and/or tiny deposits, which are not economically exploitable by mechanised mining
- Low level of productivity
- Low level of salaries and income
- Periodic operation by local peasants by season or according to the market
- price development
- Lack of social security
- Insufficient consideration of environmental issues
- Chronic lack of working and investment capital
- Most working without legal mining titles
- traceability problems: Missing trust and complicated value chains make it difficult to trace back big numbers of gemstones and to fulfil the increasing demand of consumers to know more about the source of the gemstones (Gems Africa Virtual Conference, 2021)
- Conflicts between LSM and ASM (Mining Together Large-Scale Mining Meets Artisanal Mining: A Guide for Action, 2009) mining on the same sites.
- Gender inequality: Especially women make up significant portions of the ASM workforce and suffer from specific forms of workplace discrimination. Unequal pay for similar work, sexual harassment, and the inability to own land or mining titles without permission are but some of the ways in which women's decent work outcomes are hampered. (McQuilken and Perks, 2021)

Acknowledgements

Thank you to all the people from all parts of the gem industry who kindly shared their insights and experiences. Special thanks to Jutta Werling-Durejka from Aurhen, Stuart Pool from nineteen48, Michel Abouchar from Abouchar SA, Leander Schorr from CEYLONS and Dr Laurent Cartier from SSEF.

References

2009. *Mining Together Large-Scale Mining Meets Artisanal Mining: A Guide for Action*. [online] The World Bank. Available at: <<https://openknowledge.worldbank.org/handle/10986/12458>> [Accessed 30 September 2021].

2013. *Fairtrade Standard for Gold and Associated Precious Metals for Artisanal and Small-Scale Mining*. [online] Fairtrade International. Available at: <https://files.fairtrade.net/standards/2015-04-15_EN_Gold-and-Precious_Metals.pdf> [Accessed 30 September 2021].

2021. *Fairmined*. [online] Available at: <<https://fairmined.org/>> [Accessed 30 September 2021].

2021. *SUSTAINABLE LUXURY CONSUMER REPORT 2021*. Cordoba: Traceable Luxury Services, S.L., p.3.

2005. *2005 World Summit Outcome*. [online] New York: United Nations General Assembly, p.12. Available at: <https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_60_1.pdf> [Accessed 30 September 2021].

Alliance for Responsible Mining Standards Team, 2020. *Code of Risk-mitigation for artisanal and small-scale mining engaging in Formal Trade Version 2.0*. [online] Alliance for Responsible Mining. Available at: <https://www.craftmines.org/wp-content/uploads/2021/02/CRAFT_2.0_VOL-1_Ingles_VersionFinal.pdf> [Accessed 30 September 2021].

Brundtland, G., 1987. *Our Common Future*. [online] Oslo: World Commission on Environment and Development. Available at: <<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>> [Accessed 30 September 2021].

Cartier, L., 2020. The Journey of Ethics - A Review of Responsible sourcing Developments in the Gem Sector. *InColor Magazine*, Winter 2020(45), p.31.

Earth Systems. 2021. *A Brief History of Mining - Earth Systems*. [online] Available at: <<https://www.earthsystems.com/history-mining/>> [Accessed 30 September 2021].

En.wikipedia.org. 2021. *Mining - Wikipedia*. [online] Available at: <<https://en.wikipedia.org/wiki/Mining>> [Accessed 30 September 2021].

Geology Portal. 2021. *Mines & history of mining*. [online] Available at: <<https://www.geologieportal.ch/en/themes/mineral-resources/history-of-mining.html>> [Accessed 30 September 2021].

Hentschel, T., Hruschka, F. and Prister, M., 2003. *Artisanal and Small-Scale Mining - Challenges and Opportunities*. [online] London: International Institute for Environment and Development and WBCSD. Available at: <<https://pubs.iied.org/9268iied>> [Accessed 30 September 2021].

Human Rights Watch. 2021. *Sparkling Jewels, Opaque Supply Chains*. [online] Available at: <<https://www.hrw.org/report/2020/11/24/sparkling-jewels-opaque-supply-chains/jewelry-companies-changing-sourcing>> [Accessed 30 September 2021].

In: *Gems Africa Virtual Conference 2021*. 2021. Gems Africa Virtual Conference 2021. [online] Available at: <<https://aweik.or.ke/pec-events/gems-africa-2021-virtual-conference/>> [Accessed 30 September 2021].

IRMA - The Initiative for Responsible Mining Assurance. 2021. *Home - IRMA - The Initiative for Responsible Mining Assurance*. [online] Available at: <<https://responsiblemining.net/>> [Accessed 30 September 2021].

Lexico Dictionaries | English. 2021. *Definition of ETHICAL by Oxford Dictionary*. [online] Available at: <<https://www.lexico.com/definition/ethical>> [Accessed 30 September 2021].

McQuilken, J. and Perks, R., 2021. *2020 State of the Artisanal and Small- Scale Mining Sector*. [online] Washington, D.C.: World Bank, pp.1, 96. Available at: <<https://delvedatabase.org/resources/2020-state-of-the-artisanal-and-small-scale-mining-sector>> [Accessed 30 September 2021].

National Geographic Society. 2021. *Mining*. [online] Available at: <<https://www.nationalgeographic.org/encyclopedia/mining/>> [Accessed 30 September 2021].

OECD, 2016. *OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Third Edition*. [online] Paris: OECD Publishing. Available at: <<http://dx.doi.org/10.1787/9789264252479-en>> [Accessed 30 September 2021].

Pool, S., 2021. *Questions about ethical mining*. Interview

Responsible Jewellery Council. 2021. *Find an RJC Certified Member • Responsible Jewellery Council*. [online] Available at: <<https://www.responsiblejewellery.com/membership/search-the-rjc-membership-register/>> [Accessed 30 September 2021].

Responsible Jewellery Council. 2021. *The RJC Vision • Responsible Jewellery Council*. [online] Available at: <<https://www.responsiblejewellery.com/about/history/>> [Accessed 30 September 2021].

Responsiblemineralsinitiative.org. 2021. *Responsible Minerals Initiative*. [online] Available at: <<http://www.responsiblemineralsinitiative.org/>> [Accessed 30 September 2021].

Sdgs.un.org. 2015. *THE 17 GOALS | Sustainable Development*. [online] Available at: <<https://sdgs.un.org/goals>> [Accessed 30 September 2021].