(En)Gendering the Mineral Supply Chain: Women's Work and Livelihoods in 3T Extractivism in Africa's Great Lakes Region

By

Allison Anna Wheeler Furniss

Student Number: FRNALL003

Supervisor: Dr. Fiona C. Ross

A dissertation submitted in fulfilment of the requirements for the degree of Doctor of Philosophy (Ph.D.) in Anthropology in the Faculty of Humanities, University of Cape Town, South Africa

June 2025

COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature: Date:13 June 2025

ABSTRACT

This dissertation examines the everyday working context of women along the 3T mineral supply chain in Africa's Great Lakes region. 3T's (tin, tungsten and tantalum) are collectively known as "digital minerals" and classified as critical minerals, central to the production of digital technologies. Using a broad definition of extractivism, this research focuses on women who work in artisanal and small-scale mines (ASM), as well as women in downstream production roles along the supply chain. This includes female mineral traders, transporters, mine owners and women working along the export route. As a multi-sited ethnography, this study uses participant observation, interview and focus group methodologies. The androcentrism of extractivism creates a working context with significant gendered divisions of labour, gendered vulnerabilities and barriers to work. Due to these factors, women experience various extractive violences in gendered ways. These include subtle violences that are material and embodied, premised on disposability. Nevertheless, within the overall working context for women, I argue that women's everyday actions, how they narrate their everyday working context and their "ways of operating" all show that women seek to reframe and insert themselves into dominant narratives, reject victimisation and reappropriate space and place in extractivism. These combined factors contribute to a slow acceptance of their participation. Lastly, I show that as one follows the chain of production, women's participation in extractivism decreases as economic opportunities increase, in an inverse relationship. By focusing on women who put the 3T mineral supply chain in motion and whose labour contributes to the manufacturing of digital technologies, this dissertation (en)genders a global supply chain. This research is based on 13 months of ethnographic fieldwork conducted in 2022-2023 in eastern Democratic Republic of the Congo, Rwanda and Tanzania.

Key words: Women, ASM, 3T's, global supply chains, Central Africa, mining, gender, the everyday

Résumé :

Cette thèse examine le quotidien des femmes travaillant tout au long de la chaîne d'approvisionnement en minerais 3T dans la région des grands lacs d'Afrique. Les 3T (étain, tungstène et tantale) sont aussi appelés « minerais numériques », cruciaux tant ils sont essentiels à la production de technologies numériques. En utilisant une définition large de l'extractivisme, cette recherche se concentre à la fois sur les femmes qui travaillent dans les mines artisanales et à petite échelle (ASM), et sur celles qui jouent un rôle dans la production dans la chaîne d'approvisionnement. Il s'agit notamment des négociantes en minerais, des transporteuses, des propriétaires de mines et des femmes travaillant le long des voies d'exportation. L'androcentrisme des exploitations minières engendre un contexte professionnel traversé par d'importantes divisions du travail, vulnérabilités et barrières liées au genre. Dans cette thèse, je montre qu'à travers les « manières de faire » et les manières de dire leur travail au quotidien, les femmes se font leur place dans les récits dominants, rejettent la victimisation et défendent un espace à elles dans l'extractivisme, contribuant à une lente acceptation de leur participation. Je soutiens en outre que les femmes subissent diverses formes de violences, que je qualifie d'« extractives » et envisage dans leurs spécificités genrées. Je documente enfin, en suivant la chaîne de production, que la participation des femmes diminue à mesure que les opportunités économiques augmentent. En se concentrant sur les femmes dont le travail contribue à la fabrication des technologies numériques, cette thèse révèle l'intérêt de penser une des plus importantes chaînes d'approvisionnement au monde au prisme des rapports sociaux de sexe. Bâtie à partir d'une ethnographie multi-située, cette recherche s'appuie sur 13 mois de travail de terrain mené en 2022 et 2023 dans l'est de la République démocratique du Congo, au Rwanda et en Tanzanie. Elle repose sur les méthodologies d'observation participante, d'entretiens et de focus groupes.

Mots clés : extractivisme, exploitations minières, ASM, 3T, chaînes d'approvisionnement mondiales, genre, femmes, quotidien, Afrique centrale.

DEDICATION

I dedicate this dissertation to the women of eastern DR Congo, who, at the time of writing, are suffering war and displacement.

Je dédie cette thèse aux femmes de l'est de la République démocratique du Congo qui, au moment de la rédaction de ce document, souffrent de la guerre et des déplacements de population.

ACKNOWLEDGEMENTS

First and foremost, I thank all the women in DRC, Rwanda and Tanzania who participated in this study. This research would not have been possible without the generosity and courage I received from all of you who took time to talk to me, permitted me to work with you and, in some cases, invited me into your homes and introduced me to your families. I hold a tremendous amount of debt to each of you and I greatly appreciate your participation and encouragement in this project.

I wish to thank my supervisor, Dr. Fiona C. Ross, whose intellectual guidance throughout this process has been vital. Your thoughtful but rigorous feedback has been appreciated, especially in encouraging me to think critically and engage deeply with difficult topics. Your inspiration and thoughtful engagement can be found throughout this dissertation, and I owe much of my theoretical thinking to you. All shortcomings are purely my own. Moreover, I am extremely thankful for your compassion, understanding and flexibility throughout the fieldwork process of this research, which was full of change and unexpected challenges. You always went above and beyond in helping me solve problems and I am deeply grateful for that support.

I would like to thank all the local partners and mentors I worked with on this project. In DRC, Angélique Nyirasafari was the woman who made my fieldwork in Masisi possible. You are one of the strongest women I know, and I am thankful for our years of friendship and your continued guidance. You inspire me. Baraka Gabriel, thank you for your care and protection. Janvier Murairi, I thank you for the many laughs, your encouragement throughout fieldwork and your incredible insights. I am thankful to have you as a friend and mentor, you are a true academic. In Rwanda I wish to thank Aline Nkundibiza and Bernard Nsanzimana. You both assisted greatly with making research possible in Rwanda and your guidance throughout fieldwork was invaluable. Aline, I am incredibly indebted to you for your facilitation of introductions and the research in Rwanda overall. I truly value our friendship and am thankful for our shared moments of laughter and your openness. In Tanzania I wish to thank Rose Mwaipopo at the University of Dar es Salaam. Thank you for assisting when needed. I deeply thank my research assistants in Rwanda

and DRC (who have asked not to be named). You both became dear friends, and I appreciate your flexibility, patience and courage throughout. I would also like to thank the private mining company (which I am keeping anonymous) that provided the fieldsite for this study, especially the CEO who facilitated my access. To all the staff I worked with, thank you for being welcoming and generous in your support and time. I do really commend the company for its efforts to promote women in mining.

On a personal level, I am thankful to many family members who helped in all kinds of different ways. My brother, Dr. Jamie Furniss, you are always the best sounding board. I could not have made it through without your reasonable and sound take on things, as well as your ability to see the humor in difficult situations. To my aunt, Dr. Mary Alice Wheeler who always provided encouragement and compassion when I needed it most. To my parents, Nancy and Rick Furniss, who, despite regularly having heart attacks about where I was and what I was doing, did not try too hard to stop me.

This research was made possible through a scholarship I received from the Pierre Elliott Trudeau Foundation in Canada.

There were so many layers of constraint and difficulty in conducting this research, many of which I discuss in the pages that follow, but others that I do not. I am thankful to all those who made the journey lighter and for the incredible friendships formed along the way.

Table of Contents

ABSTRACT ..... **II**

DEDICATION ..... **IV**

ACKNOWLEDGEMENTS ..... **V**

LIST OF IMAGES ..... **IX**

LIST OF GRAPHS ..... **IX**

LIST OF TABLES ..... **IX**

LIST OF APPENDICES ..... **IX**

ACRONYMS ..... **X**

CHAPTER ONE: INTRODUCTION **1**

- Literature Review 14
  - *Commodities and Global Supply Chains* *14*
  - *Study Context: Country Overviews, Mining Histories & Conflict* *16*
  - *The Mining-Conflict Nexus – Formalisation and Traceability* *24*
  - *Contemporary Mineral Governance* *29*
    - Democratic Republic of the Congo 29
    - Rwanda 31
  - *Women in Mining and Downstream Production* *33*
  - *Gendered Divisions of Labour* *40*
  - *Situating the 3T Mineral Supply Chain in Africa's Great Lakes Region* *42*
- Theoretical Framework 45
- Objective of Study 53
- Dissertation Outline 55

CHAPTER TWO: METHODS **58**

- Epistemology 60
- Fieldsites and Access 63
- Ethics 66
- Participation and Research Assistance 68
- On Anthropological Research in Contexts of Everyday Violence and Conflict 70
- "Terror As Usual": Methodological and Epistemological Considerations in The Field 75
- Walking Softly: Strategies for Conducting Research Under Constraint 81
- Gendered Dimensions to Method and Practice 86
- Conclusion 88

CHAPTER THREE: (EN)GENDERING THE 3T MINERAL SUPPLY CHAIN **92**

- Extractive Processes and the 3T Mineral Supply Chain 94
  - *Mine Workers* *99*
  - *Mine Owners* *101*
  - *Subcontracted Company Owners* *102*
  - *Female Founded Cooperatives* *105*
  - *Mineral Transport* *107*
  - *The Export House* *108*
  - *The Export Route* *109*
- The Same Soil: Blended Spaces of Living and Extracting 113
- Tangled Relations of Production: When the Home is the Mine 116
- Gendered Temporalities: Rhythms and Linkages Along the 3T Mineral Supply Chain 120
  - *Rwandan Rhythms of Work* *121*
  - *Congolese Rhythms of Work* *126*
  - *Everyday Rhythms in Downstream Production Roles* *126*
- Conclusion 128

CHAPTER FOUR: PATHWAYS INTO WORK IN EXTRACTIVISM 133

MOTIVATIONS FOR WORK IN MINING 135
Economic Necessity *135*
Accessibility *138*
Intergenerational, Kinship and Community Influences *139*
"Connections" and Formality *142*
Government Intervention *143*
"I Like Adventure!": Motivations for Work in Downstream Production Roles *145*
CONCLUSION 149

CHAPTER FIVE: EXTRACTIVE VIOLENCES ALONG AN EXTRACTIVE FRONTIER: GENDERED VULNERABILITIES AND BARRIERS TO WORK 154

MATERIAL VIOLENCE: GENDERED EXTORTION IN THE DRC 157
PHYSICAL VIOLENCE: "I HAVE TO EVEN USE MY BODY TO BE ABLE TO WORK" 166
MINING AND MOTHERHOOD: LOST INVESTMENTS 171
SPONGES OF MINE TOXICITY: GENDERED HEALTH IMPACTS TO MINE WORK 176
CONCLUSION 184

CHAPTER SIX: REFRAMING WOMEN'S WORK: FRICTIONS IN GENDERED DIVISIONS OF LABOUR AND DOMINANT NARRATIVES 188

WITCHES AND WEAK WOMEN: GENDERED DIVISIONS OF LABOUR 190
FRICTIONS, FLUIDITY AND REJECTIONS IN GENDERED DIVISIONS OF LABOUR 197
"TO CUT THE BREAST OF THE COW": SHIFTING PERCEPTIONS OF WOMEN'S WORK 201
"IT DOES NOT HAPPEN HERE": REJECTING VICTIMISATION AND REFRAMING INTERNATIONAL DOMINANT NARRATIVES 205
WOMEN IN LEADERSHIP: FOSTERING ORDER AND ORGANISATION 209
"THEY CALL ME A MAN": WOMEN IN DOWNSTREAM PRODUCTION ROLES 211
CONCLUSION 215

CONCLUSION: UNDERSTANDING WOMEN'S WORLDS IN EXTRACTIVISM 219

CHALLENGING IMAGINARIES: CENTRAL THEMES FOR WOMEN WHO WORK IN EXTRACTIVISM 225
Not a "single story" of women working in extractivism *228*
ON CAPITALIST MODES OF PRODUCTION AND EXTRACTIVE FRONTIERS IN THE ANTHROPOCENE 232

REFERENCES: 236

APPENDICES 254

LIST OF FIGURES

Figure 1: Flow chart of 3T mineral supply chain from mines to export. 11
Figure 2: Regional focus of study. 24
Figure 3: 3T Mineral export route by road 97

LIST OF IMAGES

Image 1: Artisanal mine site in eastern DRC. 2
Image 2: A small-scale semi-mechanised mine site in Rwanda. 3
Image 3: Miners conducting sleuthing work. 9
Image 4: A miner conducts wet separation. 97
Image 5: A miner conducts dry separation. 97
Image 6: Minerals are bagged, tagged and awaiting further refinement. 98
Image 7: Packaged and processed minerals awaiting export from export house. 98
Image 8: Shipment of minerals being unloaded at shipping port. 98
Image 9: Blended spaces of living: Farm crops planted amongst mining scars. 115
Image 10: Women working at a tungsten mine. 181

LIST OF GRAPHS

Graph 1: Women's monthly incomes in USD based on position along the 3T mineral supply chain. 113

LIST OF TABLES

Table 1: Nodes of the supply chain and associated descriptions. 111
Table 2: Summary of women's pathways into mine work and downstream production roles 148

LIST OF APPENDICES

Appendix 1: Full list of participants 254
Appendix 2: Summary of mine site governance and authorities in this study 255
Appendix 3: Most relevant factors that make women's labour illegal following formal legal frameworks and mandatory traceability measures (applied across both countries). 256

ACRONYMS

AFDL	Alliance des Forces Démocratiques pour la Libération du Zaire
CAR	Central African Republic
CF	Congolese Francs
CFM	Congo Fair Mining
CNDP	Congrès National pour le Développement et la Paix
DRC	Democratic Republic of the Congo
EAC	East Africa Community
EACRF	East Africa Community Regional Force
ECD	Early Childhood Development Centre
EU	European Union
GBV	Gender Based Violence
ICGLR	International Conference of the Great Lakes Region
IMF	International Monetary Fund
ITSCI	International Tin Supply Chain Initiative
LSM	Large scale mining
MONUSCO	United Nations Organization Stabilization Mission in the Democratic Republic of the Congo
M23	Mouvement du 23 mars
NDA	Non-disclosure Agreement
NGO	Non-governmental Organisation
OECD	Organisation for Economic Co-operation and Development
RDB	Rwanda Development Board
RENAFEM	National Network of Women in Mining

RMB	Rwanda Mines, Petroleum and Gas Board
RPF	Rwandan Patriotic Front
RWF	Rwandan Francs
SADC	Southern Africa Development Community
SAESSCAM	Service d'Assistance et d'Encadrement du Small-scale Mining
SAKIMA	Société Aurifère du Kivu et du Maniema
SDG	Sustainable Development Goal
SGBV	Sexual and Gender Based Violence
SMB	Société Minière de Bisunzu
TB	Tuberculosis
UN	United Nations
UNDP	United Nations Development Plan
UNGoE	United Nations Group of Experts
UNSC	United Nations Security Council
US	United States
USD	United States Dollar
3T's	Tin, Tungsten and Tantalum

CHAPTER ONE: INTRODUCTION

This dissertation is about women who work along the 3T (tin, tungsten, tantalum) mineral supply chain from extractive sites to downstream production roles in Africa's Great Lakes region. This includes women who work as miners, meaning who conducted the physical extraction and processing of minerals; as mineral traders and transporters; as mine-owners; and in various auxiliary roles along the mineral export route crossing nation-state boundaries. These varying positions have unique gendered and labour dynamics and women's participation and incomes are varied. The study took place in Africa's Great Lakes region, primarily in the eastern Democratic Republic of the Congo (hereafter DRC or the Congo) and Rwanda. It also includes ethnographic observations and interviews from Tanzania along the mineral export route.

The portion of this dissertation that focuses on mining involves women who work in artisanal and small-scale mining (ASM) which is "low-tech, labour-intensive mineral extraction and processing" (Hilson and McQuilken 2014, 104) that is estimated to directly employ tens of millions of people in Africa and is widely acknowledged as an important livelihood strategy and form of poverty-alleviation for marginalised, rural and poor residents in Sub-Saharan Africa (Hilson 2009; Hilson and Maconachie 2020). In the Great Lakes region, ASM exists within highly formalised legal structures and labour systems, rooted in development agendas and histories of conflict, which I discuss below. Despite this formalisation, informal mineral extraction continues to occur, where in eastern DRC for example, scholars have estimated that half of coltan (tantalum) extraction is unregistered by the state (Geenen 2015, 5). In the present study ASM takes place in open-air mines, with some underground tunnels. Artisanal miners work for themselves in their own time and rhythm, with their own equipment (including pestle and mortar, shovels, basins and pans) but without machinery, usually with their own upfront capital or through loans from mineral traders. Miners target surface mineral deposits and sell minerals, based on daily production, to companies that own the mining rights to demarcated mining concessions or, in some cases, to intermediary mineral traders who then sell

minerals on to companies. Image One below shows an artisanal mine site in eastern DRC.[1]

Image 1: Artisanal mine site in eastern DRC.

The present study also includes small-scale semi-mechanised 3T mines, which rely on artisanal means of extraction and processing (like panning and shovelling) but also uses small machinery, like locomotives and bobcats, and production efficiency techniques, like blasting, to increase extractive outputs. Image Two shows a small-scale semi-mechanised mine site in Rwanda.

[1] All images, figures, graphs and tables in this dissertation are by the author unless otherwise specified.

Image 2: A small-scale semi-mechanised mine site in Rwanda.

Both extractive styles (artisanal and small-scale) are different from industrial or large-scale mining (LSM). LSM uses heavy machinery, requires large upfront investment (usually financed by international companies), uses advanced technologies, targets deep mineral veins, has high degrees of formalisation, has salaried employees with set working hours and are most frequently placed in gated or private areas that are closed to the public (Hilson and Maconachie 2020). Industrial mines include aboveground and underground mineral extraction, where private companies own the extractive rights to a mineral concession, usually under long-term leases with host governments. There are often clashes between artisanal miners and industrial mining companies, primarily related to grievances around property rights. For example, in DRC, industrial mines have displaced artisanal miners (Geenen 2014) and instances of violent clashes between artisanal miners and mining companies have been observed (Katz-Lavigne 2019). LSM is generally associated with formality and legality, while ASM is generally associated with informality and illegality, fostering a binary between these two forms of extraction. Beyond this ASM and LSM binary and as I discuss in the following sections, the law and governing frameworks for mineral extraction in DRC and Rwanda create distinct categories of "formal" and "informal" work even within ASM spaces and in downstream production roles. However, we will see throughout this dissertation that in actual fact these categories are porous and much more fluid then assumed, often blending "formal" and "informal" aspects of work and living.

Importantly this dissertation is not *only* about "women in mining," a term usually used to describe women who work in the physical extraction and processing of varying mineral substances, but it is *also* about women in downstream roles as you follow the mineral from mine to market. While women miners, referring to women who work in underground and aboveground extraction and mineral processing tasks, do make up a significant portion of this dissertation, the study more broadly includes women in other roles associated with the extractive industries. As such, I employ a more expansive notion of "extractivism" and "extractive work," to refer to mine work *and* downstream production roles. While the work of mine ownership, mineral trade, transport and export (downstream production roles) is not direct mineral extraction (i.e. the physical extraction of mineral substances), these roles are vital to the functioning of the broader mineral supply chain. For this reason, I include them in my conceptualisation of extractivist work, envisaging them as contributing to minerals in motion along the mineral supply chain, which in its entirety makes up extractive frontiers.

Not a new term, "extractive frontiers" most commonly refers to the physical and geographic locations where natural resource extraction takes place (Verweijen, Himley, and Frederiksen 2024; Junka-Aikio and Cortes-Severino 2017). I am conceptualising "extractive frontiers" more broadly from a blending of Anna Tsing's terms "capitalist frontiers" and "resource frontiers," including sites of extraction but also processes of extraction and global connection (2003, 2005, 2009).

Tsing describes resource frontiers as places that emerged with the exponential proliferation of capitalism's global systems of production in the late twentieth century, that rely on outsourced labour, environmental destruction and corporate transnationalism on an unprecedented scale. Resource frontiers are places imagined to be where "everything is plentiful and wild" (2005, 55); they get "discovered" and can then be exploited by private industry and (often) systems of patronage. She notes how, for people who live at resource frontiers, social, cultural, environmental and traditional aspects of everyday life change due to extractivism. These aspects are mostly destroyed, taken over by capitalism's demands for production (2005). What makes modern resource

frontiers distinct from pre-modern or modern forms of resource extraction, in Anna Tsing's conceptualisation, is the scale at which these processes now occur.

Putting her notion of resource frontiers as localised spaces in conversation with broader systems of capitalist production and accumulation, "capitalist frontiers" evokes "an imaginative project capable of moulding both places and processes" (Tsing 2003, 5102). Here, frontiers are fluid and co-constructed by global systems of production and localised social and cultural dynamics. In this way it is both the capitalist modes of production and accumulation and the localised extractive social and cultural dynamics which constitute modern frontiers, and which drive global supply chains (Tsing 2003).

Frontiers are further imagined as uninhabited vacant places, places of illegality and unruliness and hyper-masculine, but also places with a perceived endless potential. While we know that these imagined frontiers never really existed and were always inhabited by indigenous peoples (from Canada's North to Southern Africa), frontiers in the contemporary moment are emerging not as proclaimed "empty" spaces, but rather spaces of commodification and value creation, regardless of what exists in these imagined places to begin with. Within the realm of extraction, frontiers are being constantly (re)produced through capitalism's commodification of nature, which creates new "frontiers" through sites of global connection. In this way, "[a] frontier is not space itself. It is something that happens *in* and *to* space. Frontiers *take* place" (Rasmussen and Lund 2018, 388). Frontiers also "dissolve existing social orders-property systems, political jurisdictions, rights, and social contracts" (2018, 388). With this postmodernist perspective, I conceptualise an extractive frontier as a place that is created within existing spaces, spaces that are deemed to hold new value, as demands for modernity drive change and as commodities of global value shift, creating new (or revived) sites of extraction. 3T minerals (which I define below), especially tantalum (coltan) only started to hold exceptional value since the 1990's onward, with the digital revolution and the exponential growth of digital technologies. A new frontier has emerged. The mine sites in the study have become vital sources of valuable natural resources that (literally) power and connect the world. As vital sites of supply for the global community, they have become extractive frontiers, with social orders, gendered dimensions and temporalities.

Artisanal mine sites are imagined in the same way as we imagine other types of frontiers, as sites of illegality, of disobedience and of disorder. They are further imagined as masculine enclaves, void of women. What this dissertation will show is that this imaginary is far from the reality in Central African mines but and that these sites of extraction emerge as vital extractive frontiers in the Anthropocene, the current geological period where "the biosphere and geological time has been fundamentally transformed by human activity" (Moore et al. 2016, 3). By conceptualising extractive frontiers as a broader categorisation of extractive work, including sites of extraction and downstream production roles, we can better understand how modern "frontiers" exist and take shape. Importantly, I use the concept "extractive frontiers" as a form of backdrop to the study rather than a point of analysis as other studies have (Gómez-Barris 2017).

In deploying the term "extractivism," I turn to the definition of Alberto Acosta as "those activities which remove large quantities of natural resources that are not processed (or processed only to a limited degree), especially for export" (2013, 62). Acosta describes extractivism as a mode of accumulation central to the capitalist system and further argues that "extractivism has been a mechanism of colonial and neocolonial plunder and appropriation" (2013, 63), which, as we will see through the histories and contemporary context of natural resource extraction in Central Africa, brings ruin and opportunity. Acosta furthers this concept through (neo)extractivism, where historic forms of extraction continue in contemporary society, largely without benefiting local communities or assisting people and low-income countries in tackling poverty, thereby reproducing colonial forms of extraction (2013, 71). While there is debate about the term "extractivism," including its overuse (Szeman and Wenzel 2021), it is my term of choice because conceptualising extractivism as a mode of accumulation, as Acosta does, brings into focus not only natural resource extraction but also downstream production roles, fostering a more robust conceptualisation of accumulative processes. Extractivism does not stop at sites of extraction (like mine sites) but continues in downstream production roles, as seen with mineral processing at export houses. The totality of these processes creates extractivism within global capitalist processes of accumulation. This dissertation aspires to explore and unpack extractivism within and beyond mine work. This is an important intervention as most academic literature tends

to focus only on mining contexts when discussing extractivism and less so on downstream production roles. Expanding the definition of extractivism in the ways I propose adds nuance, a broader scope of analysis and originality, allowing scholars to trace links across sites traditionally separated in analysis. To this end, I theorise extraction beyond mine work, towards the entire supply chain of 3T minerals, considering broader systems and dynamics of production.

This research focuses on the minerals tin (cassiterite), tungsten (wolframite) and tantalum (coltan), commonly referred to as 3T's, which are extracted from a multiplicity of countries including Canada, Brazil, Australia, China, DRC, Rwanda and various other African countries (Merrill 2023; Shedd 2022; Schulz 2017). They are grouped together because they naturally occur together and lend themselves well to artisanal extraction, as, geologically, they are found near the earth's surface. All three are classified as "critical minerals," a categorisation determined by individual states and which changes periodically. "Critical" status is informed by the importance of these minerals to a country's national economy and for the development of security technologies, as well as based on assessment of potential supply risk (Burton 2022; USGS 2022; Commission 2023). Critical minerals are non-renewable resources and "non-energy raw materials" (Commission 2023), which alone cannot generate energy but are further identified as critical in the advancement and development of industry, technology and clean energy needs. Critical minerals should not be confused with rare earth minerals, which are minerals identified as in low global supply with low global reserves, and which do not face supply *chain* risk but rather supply risk. In contrast, critical minerals are not in low global reserve but face supply chain risk. This means governments take into consideration the governance standards and trade policies in producing countries, as well as potential supply chain bottlenecks when assessing risk factors in potential shortages and supply as it pertains to a country's needs (Commission 2023).

Each of these three minerals have many overlapping and also unique properties and functions. All three are necessary as components in digital technologies but also more broadly in industrial uses, from medical equipment to jet engines and in green energy technologies. Their properties are similar in that they are all anti-corrosive, hold an

electrical current well and are highly heat resistant. They cannot easily be replaced with another mineral without losing performance factors (Schulz 2017; Shedd 2022; Merrill 2023). From screens and GPS systems found in cell phones and electric vehicles, to solar panels and wind turbines, 3T's play a pivotal role in manufacturing. 3T's are also a commodity that come full circle in mining: for example, tungsten is used to make drill bits used to drill mining tunnels, and is thus a commodity extracted to make equipment to continue to fuel extraction.

Africa's Great Lakes region plays an important role in the global supply of 3T's, however tantalum production from the region is the most globally significant of the three. For example, between 2013 and 2018, the region accounted for half of the global tantalum production (Schütte and Näher 2020). Recent estimates of global tin and tungsten supply originating from Central Africa is 3-4% (tin) and 2% (tungsten) (Hannover 2023; Macháček, Schlossarek, and Lindagato 2022). Tantalum is the most valuable of the three minerals, but tin contributes the highest volume of production from the region. Currently the electronics industry consumes half of global tantalum production (Schulz 2017). There is no single industry that dominates the consumption of tin and tungsten due to the wide array of their uses and applications, however consumption of tin and tungsten is expected to grow due to demand for green energy technologies, electronics, construction industries and for industrial uses.[2]

Accurate, reliable and up-to-date geological survey information or production and export estimates of 3T's from the region are highly variable and difficult to acquire. Regional conflict has prohibited updated data on export estimates and geological survey information (conflict is discussed later in this chapter). In addition, poor governance and state fragility, particularly in DRC, has also hindered data collection and record keeping on these topics. While scholars have also noted the difficulty in acquiring up-to-date data on estimated mineral reserves, historic geological survey data shows substantial mineralogical deposits in eastern DRC (Nest 2011, 19). As a result, variability in accurate estimates of reserves, extractive potential and production is substantial. For example,

[2] For example, the latest USGS repot on tungsten notes an increase in demand and trade: Shedd 2022.

the only industrial tin mine in North Kivu province of eastern DRC has stated they contribute 6% to global tin supply, which is higher than regional estimates of 3-4% (Association 2025). Consequently, global 3T supply from Central Africa is likely higher than these official estimates.

The 3T mineral supply chain in this study starts at artisanal and small-scale mines in eastern DRC and Rwanda. In both contexts extracted minerals that are removed from underground tunnels (either by hand or using small machinery) are processed using hand-separation and refining techniques, including washing, magnetic separation and sleuthing. Sleuthing is a separation technique, using a shovel and water, to separate 3T's from waste matter using gravity. Image Three below is of miners conducting sleuthing work.

Image 3: Miners conducting sleuthing work.

High quality minerals are then crushed using machines to further separate waste, until the mineral takes a high value powder form. This mechanised crushing in early separation most frequently occurs at export houses in national or provincial capitals like Goma or

Kigali. In both countries export houses are referred to as a *comptoir,* the French word used locally to mean export house. Once mineral production has reached a high enough quality, based on purity testing, minerals are packed into drums which are loaded into shipment trucks and transported by road for export, from Rwanda and DRC to Tanzania from the shipping port in Dar es Salaam. Overland export and eventual shipping also takes place from Mombasa, but the fieldsite for this study only includes the Tanzania overland export route. The mines in Rwanda that are better financed, usually by foreign investors and to a lesser degree Rwandans, conduct excavation, separation, quality testing, packing for shipment and transport outsourcing at the mine site itself, rather than through export houses. Smaller mining operations sell minerals to independent export houses, which sell them to buyers. The buyers for mines in this study were companies registered in Dubai.[3] Export houses outsource shipments of 17-26 tonnes of processed materials to overland transport companies that deal with many different commodities from sugar to rice. Minerals are not shipped directly to buyers in Dubai but onward to Asia, including China, Malaysia and Thailand, for additional treatment processes and smelting. After smelting, minerals are manufactured into parts and assembled into devices and other commodities. I return to a description of this supply chain in more detail in Chapter Three, however this description provides an overview of the supply chain of interest in this study. Figure One below depicts the supply chain described here.

[3] For example: MinTerra Mineral Trading (https://www.minterra.ae) and Halcyon Metals (https://www.halcyonmetals.com). Any further information on their ownership, operations or who onward buyers are, is not information made available publicly.

Figure 1: Flow chart of 3T mineral supply chain from mines to export.

The historic, political, extractive and labour contexts are different in each country however, there are many linkages and connections. Histories of migration, trade, language, ethnicity, kinship, land and conflict are deeply connected between DRC and Rwanda. Despite a public perception of DRC as mineral-rich and Rwanda as mineral-poor, with Rwanda often considered a mere stop-over for smuggled minerals from DRC, in fact both nations have long histories of mining, with instances of pre-colonial mining of iron (Perks 2013; Nzongola-Ntalaja 2013). While DRC is significantly more mineral-rich in terms of mineral deposits and is much larger in landmass, Rwanda does have a domestic mineral industry. I discuss these interconnections in greater detail in the literature review.

In many ways the overall social and legal contexts of the DRC and Rwanda could not be more different, yet the lived working context for women is very similar. The DRC is a country that challenges conventional notions of "order," described by academics as a context of "governance without government" (Titeca and de Herdt 2011). Rwanda on the other hand prides itself on keeping societal order, strictly enforced through militarisation

and government oversight. Rwanda is amongst the least corrupt countries in Africa, ranked 48 of 180 countries globally, while the DRC is amongst the most corrupt countries in the world ranked 162 of 180 countries (International 2025). Mining legislation in DRC does not consider gender equality and women miners are actively pushed to the periphery of mine work. By contrast, mining law in Rwanda not only promotes gender equality but mandates 30% female participation in the sector. Despite these different approaches, women's experiences in mining are often similar, echoing many of the same challenges and opportunities. It is precisely because of the similarities in work and the 'everyday' that I analyse women's experiences collectively, noting where there are differences that arise from the different country contexts.

Women are highly present in ASM in Central African but face gendered vulnerabilities, exclusions and barriers to work, limiting their full participation in the sector. This is partially attributed to factors like gendered ideologies, cultural taboos and motherhood responsibilities (I explore this at length in the literature review and chapters that follow) (Furniss 2022; Buss and Rutherford 2020; Bashwira et al. 2014). Given women's participation in mine work despite their marginalisation and in the face of male dominance in the sector, this dissertation asks, How do women navigate the gendered dimensions of work in extractivism and make sense of their work? In answering these questions, this dissertation analyses women's "ways of operating" (Certeau 1988), drawing from how women narrate their lived experiences of work and the tactics they employ to navigate their work contexts. This includes consideration for how they articulate, navigate and subsequently understand their contributions, vulnerabilities and place in the sector, as well as how these narratives and actions impact their participation and social worlds of work. The dissertation theorises women's everyday lives in order to understand how women position themselves in the social worlds in which they work and live and how that positioning challenges broader social orders. Sub-questions in this dissertation include, what motivates women to work in mining and broader extractive roles? What roles do women occupy within mines and in downstream supply chain positions? How is their work context gendered? What vulnerabilities, barriers and opportunities do they face? What factors contribute to women's success in extractive work?

The dominant discourse about women who work in the extractive industries has tended to emphasise women's victimhood and their exploitation within working contexts. Through analysis of women's own narratives and actions, this dissertation argues that women insert themselves into dominant narratives, providing an alternative perspective to broader assumptions about them and their work. Women strongly reject victimisation; in doing so, they contribute to a reframing of the perception of women in extractives and to a slow acceptance of their participation in the industry. I demonstrate that women's participation in the extractive industries decreases as you follow downstream production roles and as income earning potential increases. This forms an inverse relationship between women's participation and income generation. Although women are reframing their involvement in and contributions to extractivism, they also face distinct gendered vulnerabilities and barriers to work. I argue that these challenges reveal various overlapping forms of extractive violences, including material and embodied violences, premised on disposability. These violences are experienced through financial extortion, sexual exploitation, exclusion based on motherhood and exposure to mine toxicity. Kinship and intergenerational influences impact women to differing degrees but consistently impacts their access to and motivations for extractivist work. Lastly, in drawing out the 3T mineral supply chain, I identify where women are positioned and compare their experiences along the supply chain, simultaneously arguing that the supply chain is not linear but tangled. We also see throughout this dissertation that women's work experiences are not homogeneous and sit in tensions and frictions with each other, as stereotypes, gendered ideologies and perceptions of women's roles in extractivism are experienced amongst women differently.

While I employ the term "navigate" in this study, as other researchers on female artisanal miners in DRC have (e.g. Bashwira 2017), I do so in different ways. Within a broad study context of the impacts of DRC's mining reforms on women who work in mining communities, Marie-Rose Bashwira uses the notion of "navigation," alongside the central notion of "negotiation," in her doctoral research (2017). Bashwira uses the term navigation to describe women's experiences of political and economic changes, especially in relation to insecurity. She defines it as what "denotes situations where room

for manoeuvre seems extremely limited and where people seek ways into a complex, institutional environment that is itself changing" (2017, np). She further engages the concept of "manoeuvre" as "the amount of social space that actors have to move their project or ideas forward" (2017). Agency is the form and catalyst through which she engages both navigation and manoeuvre. This is important but problematic because it over-emphasises agency without complicating it. I therefore move to think with Foucault's ideas of power and de Certeau's engaged critique of it, in particular his notions of strategies and tactics, to give extra depth and value to the concept of navigation. Doing so allows the different power structures, possibilities and constraints on agency to be more clearly described. I employ the term "navigation" in relation to how women narrate their lived experiences of work and the tactics they employ to navigate their work contexts, analysed within broader notions of power. This includes how women understand and shape their everyday experiences of mine work, focusing on their contributions to the sector and how their gendered positions are changing.

Literature Review

Commodities and Global Supply Chains

The extraction of natural resources, in this case tin, tungsten and tantalum, is done with the purpose to manufacture end-use commodities, which are sold and exchanged in both the raw from (as minerals) and in end-use products. Whether that be cell phones, GPS systems or super alloys, all of these goods are ultimately commodities. Here I define commodities in broad terms, as "objects of economic value" consisting of any product intended for exchange (Appadurai 1988, 3). By this definition, raw extracted minerals are as *themselves* commodities, which in turn are used to manufacture end-use commodities. Scholars have long argued that commodities do not inherently hold value but are given value through exchange based on social contexts and social relationships (Simmel et al. 2011; Appadurai 1988). Commodities are also a product of capitalist forms of production, founded on the unequal division of labour and wealth, which travel vast

networks of transnational linkages in production and exchange. Arjun Appaduri writes "it is the things-in-motion that illuminate their human and social context"(1988, 5). The movement of minerals and their nodes of exchange are central to understanding opportunities and challenges presented to women who work along the mineral supply chain. Minerals move up (literally up from underground tunnels) to points of processing and export, and are moved again across nation state borders and shipped across oceans, in a process of increased value. Through this movement minerals are exchanged from the hands of miners, to mineral processors and mineral transporters, to export houses, and through the hands of transport companies, security companies, shipping companies, to manufacturing and assembling companies and, eventually, to end users.

Commodities are brought to life through commodity chains, defined as "a network of labor and production processes whose end result is a finished commodity"(Gary Gereffi and Korzeniewicz 1994). However, various terms are used interchangeably in reference to frameworks that study world systems and the global economy, including "supply chain," "commodity chain" and "value chain" (Bair 2005). The term "supply chain" is considered most broad, referring to an "input-output structure of value-adding activities, beginning with raw materials and ending with the finished product" (G. Gereffi et al. 2001, 3). A global "value chain" builds on this with primary attention on *value changes* throughout the chain, as products transform from conception to final production (G. Gereffi et al. 2001). Anthropologist Anna Tsing makes a differentiation that a supply chain is a particular kind of commodity chain that is primarily driven by large companies or "firms," who are far removed from the labour they rely on, and who direct trade and production of goods, primarily by way of labour outsourcing (2009). In this structure of production, power is concentrated with the end producers and large investors of the supply chain, whose interests are primarily financial and focused on the end product. For the purpose of this dissertation, I will use the term "supply chain" in reference to the processes, nodes and sites of production and distribution highlighted in this study and to capture women's labour out-puts along these nodes and sites, within a broader theorisation of the global value chain of digital technologies.

Transnational supply chains have a long history on the continent. The exploitation of African natural resources, people and labour was at the core of colonial endeavours and is woven into the history of the continent. The historical and contemporary interconnection between natural resource extraction, colonisation and capitalism is persistent and strong. Within this colonising mission was the objectification of nature and the objectification of anyone considered "other" to Europeans and the European way of life. As Aimé Césaire critiques, the relationship between coloniser and colonised was one founded on forced labour, intimidation, assimilation, submission, brutality, subordination and oppression. He rightly points out that the basis of the colonial project was what he termed "thingification," of humans and nature alike, as objects of exploitation and as non-human (Césaire and Kelley 2000, 42). The 3T mineral supply chain and its global connections and local tensions is best understood not as something new but deeply entrenched in the colonial past.

Study Context: Country Overviews, Mining Histories & Conflict

The DRC is the second largest country in Africa and largest in Sub-Saharan Africa, with a current population estimate of 105 million (Fund 2024b). Rich in renewable and non-renewable natural resources, the DRC has over 1,100 types of mineral deposits including, tantalum, tin, tungsten, cobalt, copper, lithium, gold, nickel, oil and others (Trefon 2016). The United Nations Human Development Index ranks DRC as the 13th least developed country in the world (UNDP 2024a, np),[4] with 73.5% of the population living in poverty (Group 2024b). DRC is ranked amongst the least gender equal countries, where only 38.8% of adult women have reached "at least some secondary education" compared to 65.7% of men (UNDP 2024a, np). Women also experience among the highest rates of maternal mortality in Africa, high adolescent birth rates (UNDP 2024a, np) and persistent instances of sexual and gender-based violence (SGBV) (Maubert et al. 2022). Conflict in eastern DRC has resulted in extremely high rates of sexualised violence against women

[4] Here I employ the UNDP defined barometer of "human development" as "a long and healthy life, being knowledgeable and have[ing] a decent standard of living" (UNDP 2024a, np).

and rape used as a tool of war (Meger 2010). Studies have shown that women who live in or near ASM communities are at higher risk of experiencing sexual violence (Rustad, Østby, and Nordås 2016), due to linkages between conflict and mineral extraction (which I discuss more below). Development NGO's, humanitarian aid organisations and academics have focused attention on instances of sexualised violence during periods of conflict in DRC (J.T. Kelly et al. 2011), however instances of SGBV are not limited to periods of conflict and are frequently perpetrated by non-armed actors, including intimate partners (Østby 2016). While accurate statistics from DRC on rates of SGBV are difficult to estimate (Lewis 2022), studies have shown that rates of intimate partner sexual violence range from 41-56%, where "more than 50 percent of married women have experienced sexual abuse by their partner" (Østby 2016, 22). International dominant narratives have emphasised the high rates of SGBV against women in DRC associated with conflict and conflict-mineral discourse, which has resulted in a highly problematic unidimensional portrayal of women from the region as victims, which I discuss in more detail below and which I critique in this dissertation. Nevertheless, the rates of SGBV in DRC are shockingly high.

Natural resource extraction in what is now the Democratic Republic of the Congo, has taken place for more than a century, with records of copper extraction in the pre-colonial period (Nzongola-Ntalaja 2013, 31). However, the exploitation of natural resources became the centre of an especially violent period in Congolese history during King Leopold II of Belgium's brutal looting of ivory and rubber from 1885-1908 (Van Reybrouck and Garrett 2014). His self-proclaimed personal territory of the Congo Free State was anything but free and resulted in the death of millions of Congolese people under conditions of slavery, forced labour and brutalisation, a period argued to be the "bloodiest in the nation's history," (Van Reybrouck and Garrett 2014, 60) and "the Congo holocaust" (Nzongola-Ntalaja 2013, 20). This period also sparked "the first great international human rights movement of the twentieth century" (Hochschild 1999, 2). Natural resource extraction expanded under Belgian colonial rule, then the Belgian Congo, due to a rise in industrial mine operations across the country, until Congolese independence in 1960 (Nzongola-Ntalaja 2013, 27-33).

However, under Mobutu Sese Seko's dictatorship from 1965-1997, in then Zaire, industrial mine operations declined significantly. This was primarily due to deteriorating infrastructure, poor economic policies (notably a nationalisation policy known as Zairianization implemented in 1973), and a global decline in copper prices (Geenen 2012, 324).[5] This decline in industrial operations, coupled with a significant economic crisis beginning in the 1980s and Mobutu's promotion of "*débrouillez-vous,*" a national moto and informal policy encouraging people to "fend-for-yourself" (MacGaffey 1986; Jackson 2002), which I explore in more detail in Chapter Five, saw artisanal extraction grow significantly. ASM was first legalised in 1983 and is now an important livelihood strategy for millions of Congolese people, with scholars estimating that in North and South Kivu provinces alone, ASM supports 1.75 million people or 9-17% of the population in the region when you consider miners and their dependents (Geenen and Radley 2014, 59). According to the United States International Trade Administration minerals comprised 92.2% of DRC national exports (Administration 2024) and the mining sector grew by 18.2% in 2023 (Group 2024b). The type of extraction, whether artisanal or industrial, is dependent on the mineral substance. Scholars have noted that both industrial and artisanal mining have and continue to go through boom-and-bust cycles (Geenen and Cuvelier 2019), however the majority of 3T extraction is conducted by artisanal means (Yager 2019, 11.2). Mineral extraction in eastern DRC is also strongly linked to historical and contemporary conflict. 3T extraction has been identified as a motivating factor in regional conflict (although not the only factor) and has financed and continues to finance non-state armed groups, who are active in the region. I discuss these linkages at length in the next section.

In contrast Rwanda is amongst the smallest countries in Africa and one of the most densely populated with 14.4 million people (Fund 2024a). The United Nations Development Plan (UNDP) estimates that 48.8% of the population live in poverty (Programme and Initiative 2023, 25). Rwanda is ranked low on the United Nations Human

[5] Global copper price declines also had negative regional effects. The research of Patience Mususa in neighboring Zambia along the Zambian Copperbelt describes the negative impact this has had for women who have turned to illegal artisanal copper mining as a survival strategy in the face of economic crisis (Mususa 2010, 2021).

Development Index at 161 out of 193 countries, revealing a low standard of living, including persistently high rates of maternal mortality (UNDP 2024b, np). Rwanda has implemented landmark "gender-sensitive" reforms that legally afford women equal rights to men and which promote women's economic development (Berry 2015, 2). A top priority for the current government has been gender equality, and Rwanda is known for its high rates of women in parliament, which stands at 54.7% (UNDP 2024b, np). The Rwandan constitution guarantees that 30% of posts in decision making "organs" are held by women (Debusscher and Ansoms 2013), which largely translates to national goals of having 30% of the workforce as female across sectors. However, as scholar Marie Berry has shown, these initiatives have primarily benefited elite women, and "efforts to promote women have failed to fundamentally transform ordinary women's lives" (Berry 2015, 3). It is estimated that 29-35% of Rwandan women have experienced gender-based violence (GBV) (Umubyeyi et al. 2014), with government estimates at 35% (Habyarimana, Zewotir, and Ramroop 2021). Education rates are low, with only 14.6% of women and 18.7% of men with "at least some access to secondary education" and 54.8% of women and 66.2% of men active in the labour force (UNDP 2024b, np).[6]

"Does Rwanda even *have* mines?" was a question I was asked regularly throughout this project. Most known for coffee, tea and agricultural production, Rwanda in fact has a long history of mining and does have mineral deposits including tin, tungsten, tantalum and gold, with geological records from the German colonial period dated back to 1909 (Uwizeyimana 1988). Under Belgian colonisation, tin and tungsten mines began operating in the 1920's, exporting raw minerals (Perks 2013, 738). The historical work of Rachel Perks demonstrates that artisanal mining took place even during the Rwandan Genocide (Perks 2014, 170). Over the course of my fieldwork, many participants I interviewed in Rwanda, both male and female, reported instances of inter-generational mining, stretching back four generations or more. I explore kinship connections in mining in later chapters.

[6] Rwanda has seen exceptional economic growth in recent years and is praised internationally for this. The World Bank noted that Rwanda experienced an economic growth rate of 7.6% in 2023 (Group 2024c), while in comparison the projected growth rate for Sub-Saharan Africa was 2.5% in 2023 (Group 2024a).

In contemporary Rwanda the development, formalisation and promotion of the domestic mining industry has been a top government priority. Rachel Perks has argued that "no country, with the exception of Tanzania, has devoted as much concerted effort in advancing property rights for small-scale miners than Rwanda" (Perks 2016, 814). Mineral exports are the second largest national income generator after tourism. In 2023 mineral exports were reported to generate 1.1 billion USD in revenue, a 43% increase from the year before (Africa24 2024). There are no industrial mines in Rwanda, although there are industrial processing plants, as Rwanda is home to the only tin smelter in Africa. Mineral extraction is done through artisanal, small-scale and semi-mechanised methods. The government estimates that the mining sector employs 57, 379 people of which 11.4% are women (Rwanda Mines 2022), with some scholars estimating ASM supports 1.5% of the population (Stewart, Kibombo, and Rankin 2020, 40). The total number of people working directly in the sector is likely higher as not all miners work legally or report to the state. Using the World Bank metric of five dependents per artisanal miner as other scholars have in estimating broader impacts of ASM (Geenen and Radley 2014, 59), I estimate that 286,895 people are financially supported by the mining industry in Rwanda, at a minimum.

While this statistical information is important in providing context, in the case of Rwanda it should be approached with healthy scepticism. Studies from Rwanda have shown that economic indicators, like poverty reduction estimations and job creation estimates are often overemphasised due to political pressure (Ansoms et al. 2017). Although challenges in acquiring reliable statistical data is not solely a Rwandan problem and scholars have noted broad challenges with statistical data from Africa, including that it can be of poor quality, partial and unreliable (Jerven 2013), statistical data holds political significance, as it is used to gauge international donor funding strategies and areas to prioritise in development agendas. As a result it is vulnerable to manipulation. Nevertheless, it is clear that poverty rates remain high, the standard of living remains low and gender equality is an ongoing challenge beyond parliamentary representation.

Although they share a border and an interconnected history in and outside of mining, the DRC and Rwanda sit in political tension with each other, primarily related to questions of

indigeneity, migration, land ownership and resources. The border area is currently experiencing resurgent conflict, building on old animosities and contemporary tensions over resources and other factors, which I discuss below. Historically, migration between Rwanda and the Kivu provinces of eastern DRC can be traced back to the pre-colonial period when many Kinyarwanda speaking people (those of Rwandan decent) inhabited the Kivu highlands. The Belgian colonial administration also promoted migration from Rwanda to North Kivu to enhance the number of labourers for mines and agriculture (Vlassenroot and Huggins 2005, 129). As a result of this migration, ethnic groups from Rwanda, the Hutu, Tutsi and Twa peoples, also live in eastern DRC and have for generations (Vlassenroot and Huggins 2005, 128). Eastern DRC's North Kivu province is ethnically diverse and home to Hutu, Tutsi, Hunde, Nyanga and Nande peoples (Jackson 2006). The formation of nation-state borders in 1910 was a pivotal moment that defined citizenship rights (Vlassenroot and Huggins 2005, 129), formalising separation despite kinship, language and cultural connections across borders in the region. Historians and scholars of Central Africa identify the Rwandan Genocide as the catalysing moment that escalated tensions and resulted in the beginning of decades of conflict between these two nations, unfolding in eastern DRC (Mathys 2017; Lemarchand 2009b; Prunier 2009; Reyntjens 2009).

The Rwandan Genocide occurred from April – July of 1994, during which an estimated one million Tutsi and moderate Hutus were massacred over the course of 100 days (Lemarchand 2009a). At that time, two million refugees fled primarily to eastern DRC and Tanzania (Reyntjens 2009, 2), as well as to Burundi. In eastern DRC this included known *génocidaires* (those who committed acts of genocide), ex-military and civilians alike, blending victims and perpetrators in refugee camps, and leading to waves of retaliation attacks by the predominately Tutsi Rwandan Patriotic Front (RPF) in DRC, which continued to fuel regional violence and instability (Reyntjens 2009, 2). Scholar of Central Africa Filip Reyntjens notes that this was a period that resulted in the complete restructuring of the Great Lakes region through acts of violence (Reyntjens 2009, 3). A series of conflicts and failed peace talks (Lemarchand 2009b) followed these events, including the two Congo Wars of 1996-1997 and 1998-2003, which resulted in 5 million deaths (Turner 2007). These occurred in the east and are now largely deemed "resource

wars" associated with the extraction of 3T's and gold, discussed in the next section. In the aftermath of the Genocide the new Rwandan government began the difficult task of post-conflict reconstruction and national reconciliation. This included a series of reforms from the elimination of ethnic categories to land reform and industry privatisation; the government also promoted national reconciliation through the *gacaca* courts and the creation of a new constitution (Straus and Waldorf 2011). In the post-genocide period, the government implemented a policy of liberalisation and privatisation of the national mining industry (Perks 2016).

This period of conflict and instability further precipitated the formation of multiple armed groups in the mid-1990's onwards, many of which were supported by the Rwandan government, including past Congolese President Laurent-Désiré Kabila's party, the *Alliance des Forces Démocratiques pour la Libération du Zaire* (AFDL), which overthrew Mobutu in 1997 (Mathys 2017; Van Reybrouck and Garrett 2014, 395-462). Many of these armed groups are still active today, with ongoing formation of new groups (Stearns 2022). Many Congolese saw these groups as "proxies for Rwandan incursion" (Mathys 2017, 468) despite armed groups claiming local grievances. With Rwandan support of armed groups in the region who were causing internal violence and displacement, ethnic tensions escalated. As a result, eastern Congolese who are Kinyarwanda speaking were, and still are, considered "foreigners" or "invaders," exacerbating ethnic tension, a central element in the ongoing conflict today (Mathys 2017; Jackson 2006). Persistent conflict and instability have resulted in a large peacekeeping presence in eastern DRC since 2000. The United Nations, Southern Africa Development Community (SADC) and East Africa Community (EAC) have deployed peacekeeping troops to the region. As of January 2025 the United Nations Organization Stabilization Mission in the Democratic Republic of the Congo (MONUSCO) had 16,316 active peacekeeping personnel in eastern DRC (Peacekeeping 2025). The East Africa Community Regional Force (EACRF) has had up to 12,000 peacekeeping troops active in the region since 2022 (Muhindo 2025) and, lastly, in 2024 SADC pledged 5000 peacekeeping troops (Wolters 2024).[7] This shows the strong

[7] Due to the deaths of SADC peacekeepers in DRC in January 2025, the majority of which were South African, SADC has since rescinded their commitment of troops to the peacekeeping effort.

military presence in eastern DRC and ongoing regional and international stabilisation efforts.

The current conflict, taking place in North and South Kivu provinces, is driven by the *Mouvement du 23 mars* (M23) armed group which formed in 2012. The most recent report from *The United Nations Group of Experts for the Democratic Republic of the Congo* outlines the Rwandan government's support for the M23, which is causing current conflict, mass internal displacement, human rights abuses and whose members have been controlling mines since 2023 (Congo 2024), although the Rwandan Government denies this claim. The M23's mandate is to defend the rights of Congolese Tutsi, who they see as discriminated against in eastern DRC, as their primary grievance (Makonye 2023). More recently they have expressed intention to take over government and march to the Congolese capital Kinshasa. M23 currently controls a large section of the mineral-rich border region of eastern DRC. This includes large territories in North Kivu province, including Masisi and Rutshuru, and the recent take-over of the provincial capital cities of Goma and Bukavu in North and South Kivu provinces. As of early 2025 it is estimated that one million Congolese people have sought refuge in neighbouring countries with another 700,000 internally displaced and seeking refuge in Goma (Affairs 2025). Instances of sexualised violence and cases of rape have, once again, increased due to conflict, with at least 600 official reports of rape, although actual case numbers are likely higher (Kane 2025). In sum, a combination of control of natural resources, regional geo-politics, ethnic tensions and claims of indigeneity are at the heart of ongoing conflict in eastern DRC and the Great Lakes region more broadly. One thing is certain: eastern DRC has seen exceptionally high rates of violence and armed conflict over the last 35 years, closely inter-related to neighbouring Rwanda. Figure Two below shows the geographic locations of these countries and of the overall study including Tanzania.

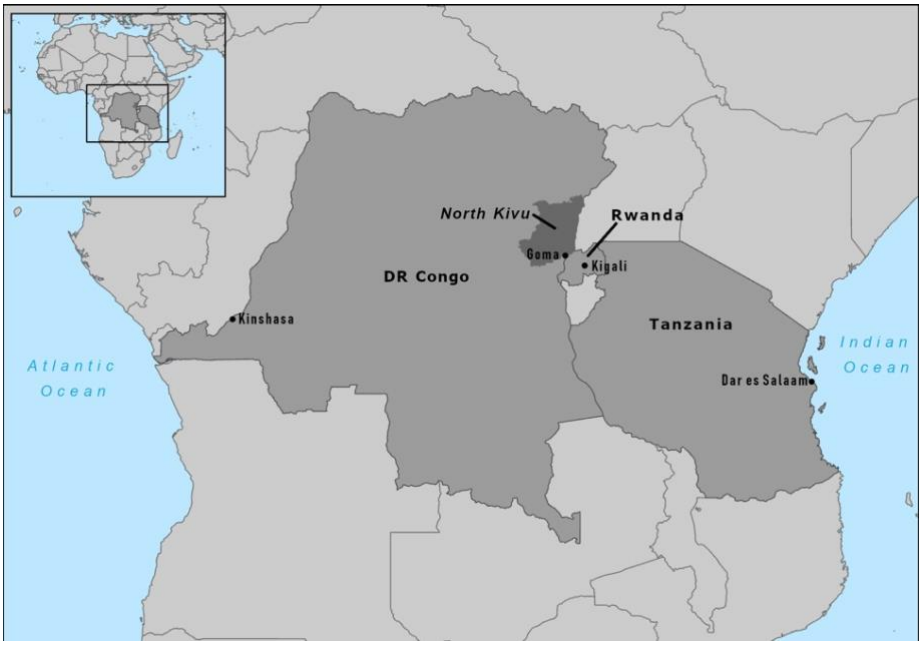


Figure 2: Regional focus of study.

(By Thomas Slingsby, UCT Libraries)

The Mining-Conflict Nexus – Formalisation and Traceability

"Where did these minerals come from? Congo?" was a common question posed to me during fieldwork in Rwanda, often stated more as an assumption than a question. The historical and contemporary landscape of mineral extraction in the Great Lakes region and most notably in Rwanda and DRC, cannot be understood without discussing regional conflict dynamics and smuggling of mineral resources. The historical connection between conflict and mining in the region has significant implications for current mining reforms and traceability measures, which affect and guide the supply chain and the participants in this study who work along it.

Global demand for tantalum exploded in the 1990s, due to a rise in production and consumption of digital technologies (Nest 2011). North and South Kivu have exceptionally high 3T deposits and the increased value and demand of tantalum combined with the fact that, although labour intensive, it is relatively easy to extract, has resulted in a massive increase in miners and mining activities in North Kivu since the

1990s (Nest 2011). With eastern Congolese mines situated within a broader context of political instability, poverty and regional conflict dynamics unfolding in the 1990s, the tantalum boom quickly became associated with child labour, forced labour, looting, sexualised violence, conflict and rent-seeking from armed groups. As highlighted above, the two Congo Wars of 1996-1997 and 1998-2003, were labelled "resource wars" by academics, intergovernmental organisations, journalists and NGOs, resulting in the emergence of "conflict minerals" discourse.

International NGOs, media and (some) academics placed enormous emphasis on this 'conflict mineral' discourse, simplifying all regional conflict causes to the illegal exploitation of mineral resources.[8] However, scholars have called attention to multiple driving factors to conflict in the region such as access to land, land rights, ethnic tensions, local grievances, state weakness, political interests of neighbouring countries, cross-border regional conflict and active non-state armed groups (Vlassenroot 2013; Vlassenroot and Huggins 2005; Vlassenroot and Raeymaekers 2009; Baaz and Verweijen 2013; Reyntjens 2009; Autesserre 2010). In sum, regional conflict dynamics are much more complicated than simply mineral extraction or mining. Regardless, 3T's and gold have been labelled as "conflict minerals" when originating in Central Africa, and are considered to fuel war and human rights abuses, notably financing non-state armed groups (Iguma Wakenge et al. 2021).

Associated with the increase in conflict during the 1990's and early 2000's was a rise in instances of sexualised violence and rape as a tool of war (Meger 2010), as just discussed. This resulted in a secondary dominant narrative emerging in parallel to "conflict-mineral" discourse, that positioned all Congolese women as victims of sexual violence and labour exploitation in the mining sector and more broadly, which scholars have critiqued (Autesserre 2012; Bashwira et al. 2014; Buss 2018). Séverine Autesserre has noted that this emphasis on the "simple narrative" of Congolese women and girls as victims of sexualised violence by the international community, has occurred "*ad nauseam*" (2012, 214). She argues that this narrative has had many unintended

[8] For a thorough discussion of this phenomenon and its ramifications, see Vogel 2022.

consequences for the local population, including obscuring other forms of violence, and has even motivated armed groups to engage in acts of sexual violence (2012, 216-217). Scholars researching women and ASM in DRC have argued this dominant narrative about women has resulted in the promotion of alternative livelihood strategies for women, rather than an analysis of women's diverse roles in ASM and promotion of their integration into the sector (Bashwira et al. 2014). My previous research has also aimed to provide an alternative perspective to this dominant narrative, discussing women's roles directly in mineral extraction and processing despite vulnerabilities (Furniss 2022), as well as strategies to maintain work in mining (Furniss 2023). This has sought to move away from a pathological representation of Congolese women as victims. While the region has seen disturbingly high rates of SGBV, this dominant narrative has created a problematic unidimensional portrayal of all Congolese women as victims and is a result of conflict-mineral discourse.

Despite the long history of mining in Rwanda highlighted above, the general perception is that all minerals from Rwandan are smuggled from neighbouring eastern DRC. Rachel Perks has argued that this has created a problematic "single story" of mineral extraction, erasing the sector's history in Rwanda (2013). While this is true, Rwanda has a long history of a domestic minerals industry, and as I have discussed, these two facts are not mutually exclusive. There is also significant evidence of regional mineral smuggling, notably since the late 1990's. According to Reyntjens (2015), the Rwandan military had an infamous "Congo Desk" in the late 1990's and early 2000's, which brokered the sale of minerals extracted from eastern DRC to foreign buyers, creating revenue for the Rwandan state. The looting of minerals in eastern DRC and associated human rights abuses sparked the United Nations Security Council (UNSC) to establish a Panel of Experts in 2000 tasked with investigating *"the illegal exploitation of natural resources and other forms of wealth of the Democratic Republic of Congo."* Its reports since 2001 have documented evidence of mineral looting from neighbouring countries (Cuvelier et al. 2014). In 2004, this initial Panel of Experts was transformed by the UNSC to *The UN Group of Experts on the Democratic Republic of the Congo*. Its most recent report describes how non-state armed groups, including the M23, control and financially benefit from mining in high producing mines, notably in Masisi, a fieldsite in this study (Congo 2024, 110).

Despite a ban on mineral extraction from the area in 2023, extraction has continued. The Panel of Experts has documented evidence of how minerals extracted from eastern DRC are smuggled to Rwanda, including arial photos and other evidence (Congo 2024, 114). Given the significant increase in Rwandan mineral exports over the past year from $772 million USD to $1.1 billion USD (Africa24 2024), which coincides with heightened conflict in eastern DRC, it is not unreasonable to consider the likelihood that export increases are associated with the on-going conflict and instability in eastern DRC and linkages to mineral smuggling.

It is these linkages between natural resource extraction and conflict that led the international community to establish extensive traceability measures and formalise extraction and trade of 3T's from DRC. A cascade of international and national legal and voluntary frameworks ensued. These now govern mineral extraction in the region (Verbruggen, Francq, and Cuvelier 2011). The European Union, the US Government, the International Conference of the Great Lakes Region (ICGLR) and the Organisation for Economic Co-operation and Development (OECD) each have their own laws or frameworks to guide mineral sourcing from DRC. The most often cited of these frameworks is section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States and the OECD *Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas,* which set out requirements for all companies that source 3T minerals from DRC and *any adjoining country* to show they sourced conflict-free minerals in the manufacturing of products. As a result, countries neighbouring to DRC, like Rwanda and Tanzania, also follow these legally binding frameworks for conflict-free mineral sourcing.

In order to achieve 'conflict-free' sourcing, companies rely on traceability schemes. There are two primary traceability schemes: "Better Mining," operated by the RCS Global Group (previously Better Sourcing Program) and the UK-based, International Tin Research Initiative's (ITRI) "International Tin Supply Chain Initiative" (ITSCI).[9] ITSCI is the dominant traceability system. It operates as a 'bag and tag' system, where all minerals

[9] For more on ITSCI see: www.itsci.org.

are packaged, tagged and registered with traceability agents (including the state and ITSCI), to show from where minerals originate. This process validates minerals from mine sites through all trade, transport and initial processing, to industrial smelting plants primarily found in Asia. Under the United States-legislated Dodd-Frank Act requirements, any company that sources 3T minerals from Central Africa must report to the US Government that they are conflict-free.

Scholars and NGOs have argued that the frameworks, while well-intentioned, have had negative unintended consequences. A Global Witness report published in 2022, at the start of my fieldwork, found that ITSCI has attempted to undermine its traceability competitors, causing instances of violence between miners and local mining companies and that the ITSCI program facilitates mineral laundering (Witness 2022). Scholars have shown that pre-existing informal trade networks have continued despite ITSCI, circumventing traceability measures, contributing to an increase in mineral smuggling due to strong social relations in trade networks (Wakenge, Dijkzeul, and Vlassenroot 2018). Christoph Vogel has demonstrated that ITSCI has pushed many mineral traders out of business and decreased their profits (2022, 144-145), as well as worsened the overall socio-economic situation of miners and traders because of formalisation and traceability measures (2022, 109-130). Through a survey conducted with miners and traders on formalisation and traceability, respondents reported lower incomes, less access to health care and less economic security to send their children to school, despite many respondents having a high degree of education themselves, revealing a "significant reversal of intergenerational development gains" (2022, 121). Vogel is highly critical of ITSCI. He argues that ITSCI has become, quoting Mbembe, a form of "private indirect government" (2022, 154), that undermines national government, disregards the presence of armed actors and imposes uneven rules for their own benefit (2022, 173-197). Traceability measures are interlinked to national legal frameworks which govern mineral extraction, and which hold significant implications for female artisanal miners. In DRC, mining law has specific limitations on women who work in mines and categorises labour in a way that pushes women to the periphery and inhibits their full participation in mine work (Furniss 2022), which I discuss more in the next section.

Contemporary Mineral Governance

Democratic Republic of the Congo

The Congolese government introduced a new mining law in 2002, which was updated in 2018, that governs both industrial and artisanal mining.[10] *The Mining Code* and *Mining Regulations* outline the legal requirements for artisanal miners, including that a miner must: be a Congolese citizen, hold either a digging permit or a trading permit depending on the kind of work conducted, be a member of a local workers collective (or form one if none exists) and that a miner can only work in designated artisanal mining zones.[11] Digging and trading permits are legally printed under the name *Carte de Creuseur* or *Carte de Négociant* in a passport-style booklet. Within mining communities, the term *creuseur* is used to mean digger (for those conducting the work of exploitation) and *négociant* to mean trader (for those buying, refining and reselling). This is a clear separation of tasks by law, with a different permit issued depending on which type of work a miner conducts, showing a government legal binary of artisanal mine work as either that of exploitation or trading. These categories create a system open to multiple intermediaries. For example, traders can buy from many different miners, collecting large stockpiles of minerals and selling medium-to-high mineral quantities to export houses. Every mine site must go through a validation process, a joint venture between multiple stakeholders including government, NGOs and traceability agents who periodically check that mine sites are operating in secure environments and upholding human rights and environmental standards. Based on this assessment, mine sites are validated using a traffic light system as either red, yellow or green, to determine if mine sites are "conflict-free" (Iguma Wakenge et al. 2021). Children are also prohibited from entering mine sites to avoid instances of child labour, although an exact age for "children" is not specified (D'Souza 2007, 12-13).

Neither the Code nor the Regulations specify much regarding women. The Regulations make no mention of women at all. The Code stipulates that pregnant women are not

[10] Law no. 007/2002 of 11 July 2002 modified law no. 18/001 of 9 March 2018 for Mining Law. Decree no. 038/2003 modified no.18/24 of 8 June 2018 for Mining Regulations.
[11] Mining Law, T.1 Ch.1 Art. 19.

allowed to engage in mineral extraction or commodification and that the "rights" of women must be upheld.[12] There is a high degree of detail regarding the governance of artisanal mining in DRC stipulated in these documents, however the mining law largely favours industrial extraction. Indeed, scholars such as Marie Mazalto (2008) have discussed the influence of international financial institutions, such as the World Bank and International Monetary Fund (IMF), in drafting the law to attract foreign investment. Despite the legal framework that governs the artisanal mining industry, miners do still work illegally. Illegal mining manifests in multiple ways including when miners work without a permit or under someone else's permit, outside of designated extractive zones or in mine sites where armed actors are present.

My previous research (Furniss 2022) critiqued the legal system for often forcing women to work illegally or "in-between" these legal and regulatory binaries. This is primarily due to women's lack of access to capital to buy, refine and resell large enough quantities of minerals to enter the "formal" trade channels where traceability tagging begins. I noted that a high concentration of women work as *petit négociants* (small traders), conducting trading work in small mineral quantities, working with a digging permit, yet excluded from the official trade system. As a result, women's positions in mine work are more precarious and they are more vulnerable to exploitation and abuse. The legal framework also fosters a challenge for women in relation to motherhood. Women often work with breastfeeding babies but misinterpretation of the law by state authorities around the ban on children in mines has forced women to flee mine sites when working with babies, exposing women to economic disadvantages. Women also went to great lengths to hide their pregnancies in order to keep working (Furniss 2022). All these factors have negative social and economic impacts for women and contribute to a high number of women separating and refining minerals from their homes, blending home and workspaces, as I show in Chapter Three.

[12] Mining Law, T. 1, Ch. 1, Art. 5 and T. 8, Ch. 4, Art. 28, sub-article, 299. A definition of the 'rights of women' is not provided.

Rwanda

The Rwanda Mines, Petroleum and Gas Board (RMB), governed by law N°07/2017, is responsible for all mining and quarry activities in Rwanda. RMB manages all mining licenses and outlines health, safety and environmental obligations. The mining sector is liberalised and promotes private (foreign) investment (Postma, Geenen, and Partzsch 2021). There are no industrial mines, with all mining conducted through artisanal, small-scale and semi-mechanised methods. Mining concessions are granted by government to mining companies that can be owned by a single individual (or sometimes married couples) or a private company. Each mine company is responsible for hiring artisanal miners or what could be understood in parallel to the Congolese context as "diggers." However, very few mine workers are hired directly by a company as salaried employees; rather, they work for subcontracted companies and are paid proportionate to daily production. RMB officials do regular inspections and site visits of mines, to check that all legal obligations and standards are being upheld. Failure to meet these standards results in the closure of a mine site.

RMB commissioned a *Gender Strategy for the Mining Sector in Rwanda* published in 2022 (hereafter The Gender Strategy), which covers a 5-year period of 2022-2026. The Gender Strategy seeks to promote gender equality and gender mainstreaming in mining, including interventions to promote women's participation in mining and build women's capacities, as well as identify current gaps in gender equality. The Gender Strategy notes that the majority of women in Rwanda's mining sector work in physical extraction and mineral processing (11.4% of national mine workers) with only 22 female mine owners, making up only 16% of ownership nationally. In addition, like all industries in the country, the Gender Strategy notes a national goal of 30% minimum women's participation in the workforce. Between the time of fieldwork and writing up of this dissertation, new mining legislation was introduced in Rwanda that enhances the government's right to company ownership shares for "critical minerals" (under the auspice of protecting national interests) and outlines stronger penalties for illegal mining and illegal mineral trade (Minyati 2024).

In Rwanda there are many mining companies for small mining concessions and mine owners sometimes own multiple concessions, whereas in the DRC's North Kivu province, large mining concessions are owned by very few companies. In Masisi, DRC, during fieldwork for this study there were only two companies operating, *Société Minière de Bisunzu* (SMB) and Congo Fair Mining (CFM), each with multiple artisanal mine sites within concessions. The Rwandan system of ownership streamlines the mineral trade directly between company owners (who employ artisanal miners directly or through subcontracted companies) and export. In DRC there are more intermediaries between miners, companies and export houses and many forms of "informal" tax within mines and in downstream roles. Here I am referring to forms of taxation that fall outside of official state taxation structures, such as mandatory fees to pass through roadblocks in mineral transport or arbitrary fees levied onto miners and traders by state authorities. Scholars have documented the forms informal tax takes, for example through an "encouragement fee," which is a fee paid to state officials per bag of tagged minerals (Vogel 2022, 191). As a result, scholars have noted that mineral traders in DRC are motivated to also trade in Rwanda (illegally) because they pay less formal and informal tax there (Vogel and Musamba 2017), with some academics estimating that traders earn 10-20% more when selling minerals on to another trader in Rwanda than when compared to DRC, providing motivation for mineral smuggling (Mantz 2018). Appendix Three provides an overview and summary of factors that would make a woman's labour and/or working context illegal.

Despite the different legal frameworks for mineral governance between DRC and Rwanda, both countries must follow international traceability measures for conflict-free mineral sourcing, and both primarily use ITSCI and in some cases, Better Mining.

As highlighted here, there are many state and non-state actors involved with mining governance. In addition to government offices, private mining companies, subcontracted companies and international traceability actors, there is also the presence of traditional authorities and influence of local elites. Traditional authorities in DRC, who historically managed access to land through kings (*Mwami*), are still recognized as local actors in mineral governance and local authorities receive mineral rents. However, their role is largely symbolic (Vlassenroot and Huggins 2005, 123). In DRC, local elites also yield

significant power, influencing mineral networks and broader mineral governance (Geenen and Cuvelier 2019). In Rwanda, traditional authorities do not play a role in mineral governance which is managed by the central government. Appendix Two provides a summary of all these actors and their varying presences in Rwanda and DRC.

Women in Mining and Downstream Production

As a general matter, women globally have a rich history and strong presence of work in mining in both industrial large-scale extraction and artisanal small-scale extraction (Gier and Mercier 2006; Mercier and Gier 2007; Jenkins 2014; Lahiri-Dutt and MacIntyre 2016; Bank 2023), with recent research estimating that 30% of the global ASM workforce is female (Bank 2023, 2). However, "women's work in the mines has remained obscure and hidden, forgotten and devalued" (Lahiri-Dutt and MacIntyre 2016, 3). Focusing on Africa, historians have documented women's active engagement in underground and surface mining in the pre-colonial period (Mercier and Gier 2007, 996). Scholars have documented cases of women who pass mine knowledge down generations in East African communities with long histories of mining and where women are highly involved (Hinton, Veiga, and Beinhoff 2003, 5). Women work in exceptionally high numbers in ASM in Africa, where, for example, in DRC it is estimated that 50% of the ASM workforce is female (Stewart, Kibombo, and Rankin 2020). While this also reflects women's marginalisation and disproportional presence in the informal sector, described by Kuntala Lahiri-Dutt as the "informalization and casualization of women's work" (Lahiri-Dutt 2011, 334), it does nevertheless demonstrate women's active involvement in the direct physical extraction, processing, and trade of natural resources.

There has been a recent upsurge in interest in and analysis of women in mine work with a regional focus on Central Africa (Buss and Rutherford 2020; Hinton, Manders, and Danielsen 2016). In the Congolese context scholars of industrial mines have examined women's roles as "miner's wives" in promoting and upholding Christian values encouraged by mine companies and in supplementing household incomes (Rubbers 2015). Other studies have shown that despite gender inclusive policies women's labour

continues to be devalued and large gaps persist between policy and practice in the promotion of women in mining (Pugliese 2021). The literature on gender in mining in DRC has focused significantly more on the ASM context. Here academics have examined a multitude of topics.

Studies have shown that women actively seek mine work with an ambition of starting a new life, for economic reasons and to escape insecurity (Bashwira and van der Haar 2020; Maclin et al. 2017). While some scholars take a more positive approach, noting that women who work in mining do so as a way to make the best out of life and as a strategy to improve their lives (Bashwira and van der Haar 2020), others emphasise that economic necessity – notably poverty – drives women to mine work (Maclin et al. 2017). Despite the economic opportunities presented to women through mine work, income comparisons have shown that men consistently earn more than women, even when conducting the same work (Byemba 2020).

As highlighted in the previous section, scholars have analysed women, ASM and sexual violence linkages. Marie-Rose Bashwira et al. (2014) have critiqued regional dominant narratives that emphasise conflict-related sexual violence as obscuring women's roles in ASM and the importance of the industry in their livelihoods. The authors further support policy, government and development interventions that encourage the inclusion of women in mining, rather than promoting alternative livelihoods. Doris Buss has traced the genealogy of "conflict-mining-related sexual violence," critiquing the linkages between mining and sexualised violence as unclear and in need of more robust data and in-depth inquiry (2018). In an analysis of mining reforms on miners and mine communities, Iguma Wakenge et al. observe that these reforms have not adequately addressed challenges facing female miners, but some secondary effects have benefited women, such as increased security and the demilitarisation of mine sites (2021).

My research has analysed women's gendered exclusions to mine work, notably how social and legal barriers prohibit women's full participation in mine work with negative economic impacts (Furniss 2022). This includes "invisible" barriers to mine work based on social norms surrounding notions of femininity and masculinity, which position

women as “too weak” for certain mine tasks, concentrating their labour in more precarious positions. Legal frameworks and misinterpretation of the law further disadvantage women, obscuring their contributions (2022). Building on this, I have argued that women have multiple strategies to counter these gendered exclusions, fostering a form of infra-politics (Furniss 2023). I observed these strategies to be both individual and collective, where female miners used secret alert systems and individual tactics like running away in order to by-pass vulnerabilities (2023). In other cases, academics have analysed how women navigate the multiple and changing governable orders of artisanal mine sites, seeking to understand how and why some women are more successful than others in their work (Bashwira and Cuvelier 2019). The authors note that women’s navigation styles are distinctly gendered, individualised and shaped by gendered solidarity (Bashwira and Cuvelier 2019). My previous academic work (Furniss 2021, 2023) has also included analysis of solidarity between women in mining, including how gendered solidary assists women in maintaining work, for example through women’s childcare strategies.

Gendered dynamics in Congolese artisanal mining have also been explored through the lens of masculinities, showing how masculine gendered subjectivities are crafted. Studies have analysed how men experiment with masculine identities or what it means to “be a man” through mine work (Cuvelier 2014, 2017), as well as how men use parallel language in describing mine work similar to that of hunting practices, argued to foster a “new rite of passage into manhood” (De Boeck 1998, 796). Other scholars have called for less attention on gendered experiences in DRC artisanal mines and more focus on collective identity through the working context in mines (Bryceson and Geenen 2016). These writers argue that mining spaces are primarily shaped by group identity based on an occupational solidarity, as in doing the hard and physical labour of artisanal mining, rather than on gender or other modifiers (Bryceson and Geenen 2016). However, this work has focused on male mine workers (likely because the majority of mine workers are male), raising questions of how gender and other intersectional realities affect the work, identity and “everyday” differently between men and women within mining spaces – all questions this dissertation seeks to answer.

Academic research has also analysed motivations for work in mining in DRC, with gendered considerations. Scholars have noted that artisanal miners are motivated to move to the mines for blended "push" and "pull" factors, where poverty (push) or a hope of "striking-it-rich" (pull), motivate migration to mining enclaves (Hilson 2009). In eastern DRC, scholars have shown that conflict and insecurity have made agricultural work less tenable, contributing to a "distress-rush" motivation, a hybrid motivation of desperation and fortune seeking (J.T.D. Kelly 2014). These migratory patterns are also gendered. As Jeroen Cuvelier states in reference to the artisanal mining context in DRC "[i]t is striking that migrant labour has remained a predominantly male affair: the vast majority of people working in the mines are men"(2017, 205). Cuvelier notes the many roles' women hold in mine work and in mining enclaves but argues that migrant labour is predominantly male because men make up the bulk of the workforce in artisanal mines (Cuvelier 2017, 205). While male migration may outnumber female migration to mines, women are also known to move to mining communities (Maclin et al. 2017; Bashwira and van der Haar 2020). Marie-Rose Bashwira and Gemma van der Haar show that women also migrate to mines for "multiple-motives" including due to "insecurity, poverty or economic opportunity, and the ambition of starting a new life" (2020, 94).

There is significantly less academic literature on women in mining focused on Rwanda. Given the national emphasis in Rwanda on the formalisation of ASM under the auspice of increasing protection for workers, Laine Munir has explored how women in Rwanda perceive formalisation (2023). Through an analysis of how work-related disputes are resolved, Munir argues that formalisation processes exist within multiple governing orders, where women perceived local mining companies as creators, not enforcers, of the law (2023). Munir has also analysed the impact of mining cooperatives on women, showing that women's membership to cooperatives does not translate into increased incomes nor reduce instances of gender-based violence within mining, but does increase women's legal knowledge and rights awareness and deepen professional networks (2022). Bernard Nsanzimana et al. have discussed the many factors that contribute to the "poor representation of women in the Rwandan mining industry" despite legal frameworks that promote women in mining (2022, 124). These factors include persistent cultural taboos in mining, for example that some work is viewed as "too risky" for women,

which negatively affect women and fosters a strong gendered division of labour that pushes women into less lucrative positions (2022, 132). This is also a core finding in the present study, which I explore at length in the coming chapters.

There is also a recent increase in regional literature on women in mining, which usually includes DRC, Rwanda and Uganda. Stewart et al. conducted an in-depth comparative study between men and women working in ASM in the region, showing that men had more experience in mining, had worked longer in the sector, consistently earn more than women, had higher levels of education, conducted more (and mostly) digging work and worked longer hours than women (2020). Their research reveals that women had more responsibilities to household expenses and dependents. It also reiterated that ASM is an important livelihood strategy for women, and the authors' research "rejects perpetuating ropes of victimhood and instead focuses on illuminating women's agency in pursuing their livelihoods" (2020, 39). Rather than consider gender as a categorical binary, Katrine Danielsen and Jennifer Hinton analysed the social relations of gender at ASM sites, meaning the power relations between men and women, which they argue are shifting, dynamic and relational (2020). The authors observe that gender norms are a central component to women's positions, successes and vulnerabilities in ASM, as well as affecting access to work and associated incomes. They note that unequal gender relations are primarily legitimised by gender norms but that gender inequalities are not static and are frequently challenged (2020). Regional literature has also shown that women consistently earn less than men, even when conducting the same work, and their labour is concentrated in processing and refining tasks (Buss et al. 2017; Stewart, Kibombo, and Rankin 2020; Byemba 2020, 423). Scholars have also explored the impacts of international frameworks that promote gender equality, like the Sustainable Development Goals (SDGs) on female miners (Buss et al. 2021). While in theory these frameworks should foster opportunities for women, they have unfortunately not translated into better policy or support for female miners, in fact consolidating their exclusion, since they are often predicated on problematic gender stereotypes (Buss et al. 2021). There has also been a recent upsurge in development initiatives aimed at female miners primarily led by NGOs, intergovernmental organisations such as the World Bank and foreign governments. These initiatives seek to provide support networks, guidance,

capacity building and funding to women's empowerment organisations which work with female miners and women working in auxiliary positions in mine communities. For example, the World Bank initiated National Network of Women in Mining (RENAFEM), is a national network of women across DRC established in 2015 that advocates for women's rights and promotion in the mining sector (Bank 2017b). These women's empowerment initiatives are working to make women's work in mining more equal and safer, as well as increasing the visibility of women in the sector and by extension addressing gendered relations in mines (Bank 2017a). However, these organisations often lack funding and support, crippling their efforts (Gouby 2024). In sum, despite this increase in awareness, promotion and exploration of women's roles in ASM in Central Africa, their positions and roles are not equally upheld or adequately promoted or implemented.

In shifting the focus from mine workers to women's roles in downstream production, literature becomes thin. Literature on mineral traders has been skewed towards men and the majority of research on 'women in artisanal mining' has focused on women who engage in physical mineral exploitation and processing, with fewer studies including the lived experiences of female mineral traders, usually only mentioning the presence of female traders. Christoph Vogel and Josaphat Musamba explore how male traders navigate uncertainty in their work and broader country context, arguing that traders are key social and economic brokers (2017). The authors explore aspects of traders' lived experiences, including the historic rise of mineral traders as intermediaries in the mineral trade; commonalities between traders (such as education levels); and everyday considerations such as systems of debt in working with diggers, formal and informal taxation levied on traders and their relationships with state and non-state armed groups (2017). Timo Makori includes ethnographic insight from male mineral traders in eastern DRC's South Kivu province in his critique of ITSCI traceability measures and discussion of the governmentality of the tin mineral supply chain (2024). This includes details on how much they earn, the kinds of taxes levied against them and their perceptions of traceability measures, which were negative (2024). Anthropologist Jeffery Mantz has analysed the social relationship between mineral traders and coltan (tantalum) in eastern DRC and discusses the relationship of the sector with neighbouring Rwanda through the lens of traders, negative attitudes towards traders and how ethnic tensions

affect the mineral trade (2018). Mantz argues that miners and traders have social relations with minerals, understood to have a transformative power in their lives (literally and figuratively) (2018). Sara Geenen has also analysed the relationship between small-scale miners and traders of gold in South Kivu (2011b). Her research has shown that traders and miners work within frameworks of cooperation and obligation, based on long-term and reciprocal relationships of trust (2011b).

When it comes to the experiences of female traders, Marie-Rose Bashwira Nyenyezi has included consideration of female mineral traders in her research, for example discussing how women move from digging to trading work and women's relationships with male traders (2017; Bashwira and van der Haar 2020). My previous research included (but did not exclusively focus on) discussion of female traders, noting that they often work illegal or "in-between" legal permit categories due to financial constraints, however this research did not include high-earning female traders (Furniss 2022). Regional research reports focusing on the Great Lakes have briefly discussed the presence of women as traders, noting their presence is much lower in numbers than men and that female traders often work at great financial risk to themselves and face difficulty reaching higher income earning positions (Hinton, Manders, and Danielsen 2016, 32).

At the next step along the mineral supply chain, at export houses, there are some reports on the political dynamics of export houses, including reports on the collusion of international buyers in purchasing and selling "conflict minerals" (Custers, Cuvelier, and Verbruggen 2009). Jeffery Mantz has included descriptions of social and labour dynamics and challenges facing export houses in his anthropological work with mineral traders (2018, 538-541). He discusses how the tax (both legal and illegal) levied at export houses negatively impacts traders and contributes to illegal trade. He also discusses the details on how export houses conduct their operations and how "outsiders" influence export houses (2018). Looking to other African contexts, Katja Werthmann has identified the role's women occupy at export houses in Burkina Faso, noting that women often operate centres for mineral processing (2009). However, her discussion of women who work at export houses falls within her broader research on women in artisanal gold mining and does not focus solely on export houses. While the literature that describes women's roles

in mining in Central Africa includes the identification of women in trade positions, there is a lack of research that examines women's experiences in these positions in detail. In considering the broader supply chain, women who work in downstream production roles are highly understudied.

This underrepresentation in literature is partially attributable to the fact that women are less present in positions of trade and mine ownership (Mugo, Ondieki-Mwaura, and Omolo 2020; Paschal and Kauangal 2023). Downstream roles require significantly more upfront capital and are generally high-income earning positions. Scholars have attributed a lack of women's participation in higher income earning positions to barriers such as higher financial pressures to support the household, kinship responsibilities, gendered practices and assumptions that "act as barriers for greater economic benefits" and lower levels of education to complete licencing documents and other administrative tasks (Buss et al. 2017, 48). Scholars have also noted that "women's lack of access to, and ownership of, mineralised lands underpins the discrimination and marginalization quagmire" (Ofosu et al. 2024, 21). In a comprehensive literature review of women's positions in the production value chain of ASM in Africa, Makungu Paschal and Jignesh Kauangal note that "at the tertiary hierarchy of mineral value chain, women rarely participate as dealers and brokers" (2023, 4). Extant literature emphasises women in production positions (as mine workers), with some examples of women who are pit owners (Paschal and Kauangal 2023). However, as this dissertation will show, women are present in these downstream positions and this dissertation seeks to fill the gap in literature I've identified above while deepening insight into the dynamics of artisanal mining.

Gendered Divisions of Labour

In mine work, as elsewhere, a strong gendered division of labour exists. Anthropological research on mining has long discussed gendered divisions of labour in different country contexts and across varying mineral substances. June Nash's ethnographic work in Bolivian tin mines in late 1970's showed "[m]ale and female roles are dichotomized in the

mining community, and there is still a mystique about women not entering the mine" (1993, 13). However, as later chapters will show, while gendered divisions of labour exist across Central Africa, they are not experienced universally but rather vary at different mine sites and in downstream production roles.

The reasons behind these divisions are primarily attributed to cultural taboos, notions of strength and weakness, gender norms and social expectations, all of which result in women's economic exclusion (Buss and Rutherford 2020). There is a frequent and persistent belief that women bring "bad luck" in underground mining and that their presence will "make minerals disappear." Men thus prevent women from entering tunnels in DRC (Hayes and Perks 2012), Rwanda (Nsanzimana, Nkundibiza, and Mwambarangwe 2022) and across Central and East Africa (Buss et al. 2017). In Rwanda, this can also include concerns about menstruating women as menstruation is believed to "curse mineral production" (Nsanzimana, Nkundibiza, and Mwambarangwe 2022, 131), fostering a barrier to women's inclusion despite a strong government emphasis on women's integration in mine work.

Perceptions of physical strength (or lack thereof) is a significant contributor to women's exclusion from mine work, veiled in a gendered "protectionist" discourse. Mining historians have noted that the guise of 'safety concerns' has been at the centre of barring women from underground mine work historically (Mercier and Gier 2007, 996) and this persists today. Ethnographic insights from Africa have discussed how, both men and women, perceive certain mine tasks as "too difficult" or "too physically demanding" for female mine workers (Furniss 2022; Rutherford 2020; Rutherford and Chemane-Chilemba 2020). The discourse surrounding physicality and safety concerns are connected to societal notions of femininity and masculinity, where "[m]ore lucrative jobs in extraction are often perceived as "masculine," requiring strength that women are not seen to possess" (Danielsen and Hinton 2020, 23).

However, scholars have critiqued narratives that justify a division of labour based on perceived differences in physical strength, noting the irony of this widely held belief across different contexts and geographic locations. As Jennifer Hinton et al. state,

“[i]nterestingly, women are engaged in digging and equally laborious activities for agricultural purposes, or in the extraction of high volume, low value commodities (e.g. clay, limestone, dimension stones)” (Hinton, Veiga, and Beinhoff 2003, 20). Here the authors reiterate the social constructs, not physical ability, that restrict and largely exclude women from high income work otherwise reserved for men. In addition, Dian Elson and Ruth Pearson’s influential critique of women’s subordinate positions in work which manifests as a result of their alleged dexterity or “nimble fingers” translates well from their factory analysis to the mine context, where women are seen to hold certain innate qualities that make them incapable of heavy mine work and more capable of processing work (Elson and Pearson 1981). Lastly, the perceived androcentrism of mine work also has historic underpinnings, where mining historians have found “that mining became more exclusively associated with men as it became more capitalised and centralised” (Mercier and Gier 2007, 996).

With men and women conducting different tasks based on the divisions of labour discussed, they also occupy different physical spaces within the mining sites. For example, based on the literature reviewed women are frequently blocked from entering underground mine tunnels, making these spaces majority or exclusively male. The research of Jennifer Stewart et al. importantly shows that across-the-board women earn less than men but are also blocked from higher income earning positions (2020). This is related to physical spaces within mining enclaves. The lack of literature on women in downstream production roles makes it difficult to know exactly how, why or if gendered divisions of labour exist as you move from the mine space to other supply chain tasks. It is one of the aims of this dissertation to explore this.

Situating the 3T Mineral Supply Chain in Africa’s Great Lakes Region

Through ethnographic research conducted at the varying steps of the supply chain and through embodied ethnography, including participating in the overland export route by truck, this study provides ethnographic richness to understanding lived realities of global supply chains. Similar supply chain literature includes Susanne Freidberg’s study of the

supply chain of green beans from Zambia and Burkina Faso to the UK and France (2004), despite our differing commodity focuses. Freidberg largely explores the connections between rural farmers in Africa with consumers in Europe, analysing production and distribution, which she argues is guided by social relationships, networks of trust, conviviality, international politics and postcolonial linkages (2004). Comparable regional literature has explored cross-border trade in Central Africa. For example, Kristof Titeca and Tom de Herdt have analysed how "practical norms" more than state intervention guide cross-border trade between Uganda, the DRC and southern Sudan (2010). However, such studies have not followed a commodity from extraction (or production) to export but rather analysed distribution points or points of trade and blockage. Existing academic literature considering mineral supply chains in Central Africa analyses one aspect of the supply chain (for example sites of extraction), which are then placed within broader debates around supply chain management, opportunities and challenges (Byemba 2020; Makori 2024). For example, Gabriel Kamundala Byemba analyses the challenges and opportunities presented to female miners in eastern DRC through ASM formalisation, when considered within broader global value chains (2020). He observes that formalisation efforts (primarily through traceability measures) have excluded certain positions on the value chain, notably precarious positions where many women are found, but that added formalities, like mandated workers associations, present opportunities for women (2020). This type of literature analyses how actors participate in global value chains at specific sites of production, engaging in broader debates about governance, income distribution and power relationships between actors along the chain and global markets. In considering broader connections in the value chain of digital technology and multiple sites of production, the anthropological work of James H. Smith examines how miners and traders (with a focus on miners) experience digital age capitalism in eastern DRC, connecting the labour of Congolese artisanal mines to consumers in North America (2021, 2015). This provides insight into global connection and linkages between producers and consumers, with a focus on people's lived experiences, which is also a point of analysis in this dissertation. In thinking with the movement, temporality and social meaning of minerals, Smith's work centres the social worlds of miners in a context of broader global connection, providing valuable insight into the global value chain of digital technology focused on these otherwise invisible sites of production (2021).

Building on this type of literature, this dissertation includes multiple nodes (steps) of the supply chain (which I define and outline in Chapter Three), rather than a single site or working context, in order to analyse the entirety of the mineral supply chain. It examines commodities in motion, from point of extraction to point of export, with a focus on the social and gendered aspects of the lives of workers who put these commodities in motion.

But what does today's 3T mineral supply chain originating in Central Africa look like? The answer to this is not straight forward due to the messy nature of mineral supply chains in the region, largely a result of "informal" labour and processes that put the chain in motion but are unspoken. As Peer Schouten points out, the informal, unregulated and invisible people and processes of supply chains are precisely what enables the functioning of global supply chains. He notes that "[w]hile battered trucks toiling along Congo's roads are possibly the very opposite of how we usually imagine global supply chains, this is precisely the way in which global supply chains look at the margins of the global economy" (Schouten 2019, 151). He further notes that "the exchange along the supply chain is one of profits travelling up, in exchange for risks travelling down the chain" (2019, 159). This manifests in the present study in a multitude of ways. As I will show, income earning potential increases along the supply chain, showing how profits travel "up" the chain. Women's labour is also most concentrated in mines as mine workers, where risks are the highest, compared to production roles "higher up" along the chain. For example, as mine workers at the bottom of the chain, women face gendered health related risks and are often forced to work illegally because of poverty or motherhood responsibilities. The combination of these factors means that the concentration of women's labour in extractivism also corresponds with the greatest risk to women and the lowest profitability for them. I explore risks and other supply chain dynamics throughout this dissertation.

Theoretical Framework

This work draws upon interconnected theoretical frameworks that have emerged from the ethnography itself, as I followed the worlds of the women in this study. This includes power, practices and notions of the everyday, as well as narrative and speech as a tool for women to navigate and understand shifting social worlds.

"Everyday life, how can we define it?" is a question posed by influential scholar Henri Lefebvre in his book "Critique of everyday life" (1961). Difficult to define and loaded with significance and variety, notions of "the everyday" include the mundane, habitual and normal activities, interactions and acts that a person undertakes on a daily basis. These "ordinary" acts or activities can nevertheless look very different based on intersectional considerations like gender, race, class, geographic location and other factors. Despite these differences, Lefebvre initiated the conversation on the meaning of everyday life and theorising 'everyday life' as a profound site for unpacking human relationships with the social and natural world (1961).

Michel de Certeau theorises "the everyday" through an analysis of everyday practices, like cooking, waiting on a train, speech acts and other activities (1988). He frames his analysis of "the everyday" in relation to structures of power, where an individual's daily actions or practices exist in relation to mechanisms of discipline and sociocultural expectations. In de Certeau's discussion power exists in relation to domination, producing "subjects" in everyday social orders. However, he claims that despite the power/domination binary and mechanisms of power that produce subjects (for example the capitalist creation of "the labourer"), this does not produce docile or passive individuals. Rather he explores people's "ways of operating," which he classifies as either "strategies" or "tactics," showing that people exist within everyday pluralities of power and domination, and that everyday actions can hold political dimensions.

De Certeau defines *strategies* as a means for "the calculation (or manipulation) of power relationships" (1988, 35) which exist in specific spaces, fostering a base (like a ground

zero) for negotiating mechanisms of power and which are institutional, planned and organised. He states that strategies are "an effort to delimit one's own place in a world bewitched by the invisible powers of the Other" (1988, 36). *Tactics*, on the other hand, are highly individualised acts, seized "on the wing," fragmented and opportunistic, as people seek to challenge mechanisms of power. A tactic is defined by the subject's "absence of power," and is a method that lacks its own space and is limited by the immediate context (1988, 37). He argues that these "ways of operating" are a way to reappropriate space and time, fostering political dimensions to everyday practices.

De Certeau's analysis is a useful point of departure "to bring to light the clandestine forms taken by the dispersed, tactical, and make-shift creativity of groups or individuals already caught in the nets of "discipline" (1988, xiv). However, use of this theoretical framework is not meant simply to identify everyday tactics or strategies that emerged in the study, so much as to assist in understanding what is meant by "the everyday." It permits a broader scope of analysis in exploring the potential significance of women's everyday practices in their working lives.

De Certeau's conceptualisation of tactics and strategies correspond and respond to different forms of power that circulate in society and in our lived experiences. Thus, in analysing the everyday, we must also look to notions of power. Power in everyday life, as conceptualised by Michel Foucault, exists through multiple techniques, technologies and mechanisms as well as in force. Power can be institutionalised by the state apparatus, for example through prisons or security services, as a highly visible manifestation of power, primarily exerted through highly visible measures of discipline (Foucault 1977, 1982). It also exists through sovereignty, meaning government itself, which has the power to govern and rule, instating and using institutions of power (Foucault 1991). Power also exists in an invisible way, through biopower, where discipline is internalised and self-policed by "the subject" (meaning person or citizen), rather than through state institutions (Foucault 1988). Biopower is especially pertinent in considering "the everyday" because it manifests more prominently within a day-to-day context within people's lives.

Foucault also argues that resistance is a diagnostic to power and power is co-constructed by subjects of power (Foucault 1982). By reversing the gaze on power relations, from forms of power to forms of resistance, we can understand power relations differently, through an analysis of what people are resisting, how and why. For example, Foucault calls on looking to what is meant by illegality to understand legality (1982, 780). In relation to the power/resistance binary, a significant body of academic literature has explored how people, notably the poor and otherwise powerless, resist forms of power in their everyday lives and how those resistances can foster a form of politics, contributing to social change (J. Scott 1987; J.C. Scott 1992; Chatterjee 2004; Bayat 2013). It is helpful to understand how power, resistance and domination co-exist, are interlinked in the everyday and how these relations can be theorised. This allows us to better analyse women's lived experiences of extractivism, since various forms of subjugation and domination co-exist within women's working contexts. They also hold gendered considerations. Feminist perspectives on the power/resistance binary have discussed gender-specific forms of discipline and control, as well as gendered ways of responding (Johansson and Vinthagen 2016). For example, women's bodies have been recognised as sites of discipline but also sites of rebellion through embodied protest. Physical spaces are also linked to gendered understandings of power and resistance – for example domestic responsibilities held by women can limit their mobility and produce spatial confinement (Johansson and Vinthagen 2016, 425-427).

Moreover, central to de Certeau's work is his emphasis on human agency. De Certeau is interested in agentive action, which I employ to complicate the idea of navigation as it currently exists in the literature (Bashwira 2017; Vigh 2009). He gestures towards the possibility for social change through individual and group actions. Anthropologist Sherry Ortner defines agency as "the forms of power people have at their disposal, their ability to act on their own behalf, influence other people and events, and maintain some kind of control in their own lives" (2006, 143). While an important concept in relation to power (especially uneven distributions of power), Ortner also cautions us that the notion of agency can oversimplify people's lived experiences, it risks ethnocentrism, and it can privilege western individualism. She notes that an emphasis on agency can cause problematic erasure of relations of power and sociality in which people are embedded,

all of which can undermine an individual's ability to engage agency (2006, 129-153). In this vein, anthropologists have discussed how social contexts like poverty can undermine the capacity for collective or individual actions, agency and subsequent outcomes (Das and Randeria 2015) and how an emphasis on "resistance" within discussions of power imbalances risks romanticising the plight of the marginalised and dispossessed (Abu-Lughod 1990b).

I remain acutely aware that many of the women in this study live in a context of significant precarity and poverty, facing many challenges in their everyday lives. Given this context, critics will argue that women are only surviving, working in mining only to foster a basic income, and are stripped of agency. However, while some women in this study are limited by poverty, affecting their potential for agency, poverty is experienced differently amongst women; likewise, women's experience of power (and its lack) is not the same for all women in this study. For example, female mine owners are relatively wealthy and choose to work in mining at great financial risk. While mindful of poverty's effect in limiting agency, I do not subscribe to discourse that emphasises the non-existence of agency due to poverty. Rather, I echo Arturo Escobar's (1995) stance that overemphasising language of survival amongst the poor amplifies the image of the poor as victims, denying them of any agency. As Asef Bayat states in his work on social movements "[t]he fact is that poor people may also resist and make advances in their lives when the opportunity arises"(2013, 49). Ortner, who acknowledges that agency is fundamentally unequal, identifies three core components to the notion of agency: intention, cultural creation and power (2006). She notes that intention reflects engagement in a process, that agency is culturally and historically constructed and that agency in relation to power is multidirectional, meaning from below and from above (2006, 134-139). In a context of multiple manifestations of biopower including male dominance, gender inequality, international and national law, marginalisation and slow violences (conceptualised by Rob Nixon (2011) as delayed invisible violences), agency exists in diverse ways amongst women in this study, as I show in the ethnographic chapters.

In considering the gendered dimensions of "the everyday," even though neither de Certeau nor Foucault reference gender, the work of anthropologist Veena Das highlights

how gendered dimensions to the everyday require consideration for violence and subjugation (2007). Das points out that there can be gendered dimensions to the everyday that interrupt "the ordinary" (in violent ways) but are still very much part of the everyday, not separate from it. Based on her ethnographic research in India, she discusses how "the ordinary" manifests violently through an example of witchcraft accusations amongst the Azande, common experiences amongst her participants but highly violent encounters (2007, 7). Because women's experiences of violence are so ingrained in the everyday, Das argues that violence is absorbed into the everyday. She states "[t]he suspicion of the ordinary seems to me to be rooted in the fact that relationships require a repeated attention to the most ordinary of objects and events, but our theoretical impulse is often to think of agency in terms of escaping the ordinary rather than as a descent into it" (2007, 7). In the present study this descent involves various forms of violence that are a foundational element to women's everyday realities across different mine sites and country contexts. Women experience violent acts of exclusion, dispossession, exploitation and, at times, physical acts of violence, including sexual and gender-based violence, within the broader context of conflict and its associated risks. With this in mind, we can consider interruptions to the everyday within broader gendered relations and approach women's experiences of marginalisation or subjugation not as dramatic instances but very ordinary daily occurrences. By (en)gendering the everyday (a concept I define in Chapter Three), we can better explore how women experience their work in extractivism, the gendered dimensions of this work and how women respond.

In further unpacking "the everyday," we must look to how everyday experiences are narrated and expressed. A narrative of personal experience can be defined as "verbalized, visualized, and/or embodied framings of a sequence of actual or possible life events" (Ochs and Capps 1996, 19). Narrative, through the act of speech, brings to life experiences contributing to understandings and imaginaries of everyday social life, including "how we attend to and feel about events" (1996, 21). Elinor Ochs and Lisa Capps argue that narrative is mutually reinforcing with the self and self-identity, whereby "narrative and self are inseparable" (1996, 20). They describe narrative as contributing to our understandings of ourselves in the world, co-constructed through speech. They also argue that narrative is partial and fragmented, situated along a temporal continuum of

past and present experiences, and future selves-in-the-making (1996, 23). Erving Goffman also argues that narration of the self exists both through words and "involuntary expressive behaviour," meaning body language or facial expressions. He sees these as performative acts and modes of narration that frequently reveal more truth than words and speech (2023, 2). By privileging personal narrative, which is "a way of using language or another symbolic system to imbue life events with a temporal and logical order, to demystify them and establish coherence across past, present, and as yet unrealized experience" (Ochs and Capps 2009, 2), we can theorise how women make sense of the everyday.

As we will see, women's self-narration of their individual experiences challenges dominant narratives, through descriptions of their "place" within the extractive industries and their understanding of how others perceive their work (and, more broadly, the positions of women in extractives). These aspects also reveal shifting perspectives of the women themselves in the extractive industries. Situated in a working context of male dominance and broader legislative and policy framings of women as passive victims, their own self-perspectives are fluid, at times contradictory, and yet still provide insight into their social worlds. These self-understandings also reveal how women navigate stereotypes, assumptions, challenges, opportunities and environments of success. Importantly we see that women are aware of dominant and general narratives about their victimisation, as well as what, in theoretical terms, can be understood as the politics of their representation (Abu-Lughod 2008b). I will show that through their counter-narratives, women reframe these imaginaries, narrating "against culture" (Abu-Lughod 2008a). While the dominant narrative about women in the extractive industries carries many generalisations – about women's bodies, their physical ability, their vulnerability, their roles as mothers and their perceived charm, – through narrative, they provide their own account of work and the everyday.

Narrative, in this way, emerges as a form of "voice" which is highly personalised and individualised, and that acquires life through speech (Das 2021, 4). Speech is enacted through language and speech acts. De Certeau draws a distinction between these. Language ("*langue*") is a system, whereas speech ("*la parole*") is an act; language

becomes the system for speech, which is an operation of language (1988, 32-33). De Certeau importantly notes that the act of speaking establishes the present moment through the speaker's use of "I," which creates "the organization of a temporality (the present creates a before and an after) and the existence of a 'now' which is the presence to the world" (1988, 33). The linking of time (temporality) with the act of speaking is an important conceptual detail, for it assists in understanding women's (re)framings of their roles and positions in extractive work in the present moment, separate from violent or oppressive pasts. The narrated present within the everyday creates a before, after and now. Speech, language, narrative and "voice" are all important elements of the everyday.

If we approach the notion of narrative as a form of "having a voice" – deeply connected to self-identity – we can consider "voice" within power imbalances as an "effort to represent one's own experience rather than accepting the representations of more powerful others" (Gal 2012, 174). However, it is not only what women say about their positions in work that is important, but also the silences surrounding their experiences. Susan Gal has explored the linkages between gender, speech and power. She argues that silences are a form of power, even political protest, that should not be mistaken for powerlessness (1989). She discusses multiple factors that affect "everyday talk" through a gendered lens, including how institutional power can deny women the chance to speak and how gendered divisions of labour make women speak differently from men, amongst other factors (1989). In exploring the linkages between gender, speech and power in depth, she references Foucault, arguing that it can actually be the silent listener who exerts power over the speaker (2012, 171).

While both having voice and staying silent can be mechanisms to exert power or challenge structures of power, the notion of voice has further been problematised by academics, who note that "voice" does not always equate to "being heard," especially when considering gendered dimensions to voice (Ross 2003). Women can also have strategic and intentional reasons to remain silent because of structures of power, not always because they seek to challenge these structures. Through analysis of the verbal testimonies of women from the South African Truth and Reconciliation Commission, Fiona Ross shows that despite being encouraged to testify and with the intention of

amplifying “women’s voices,” women rarely spoke about their own experiences of violence; instead they recounted instances and impacts of violence against male family members (2003). In other cases when women did recount experiences of violence (sexual violence in particular), it was presented in the media as the central focus of their testimonies, when in fact they were seeking recourse on other abuses (2010). Moreover, women having “voice” can contribute to further violence against them, especially when recounting instances of sexual violence (Ross 2010). Women’s silences can be partially attributable to the social and cultural factors that greatly affect what women speak about, but women may also stay silent in fear of retaliation or public shaming, since “speaking out” or “having voice” can come at a high price. This reiterates that silences can also be intentional and there are multiple factors which contribute to women’s silences. This discussion on silence matters. Many silences emerge in this study and are discussed throughout the chapters that follow. Both narrative and silence assist us in understanding the shifting social worlds of women who work in the extractive industries and how they make sense of those worlds.

In addition, words and phrases encompass values and meanings that are culturally specific. Women in this study spoke mostly in Kinyarwanda and Kiswahili, which my assistants and I translated (I return to this in the Methods Chapter). Translation is an interpretive act (Venuti 2012) that can be at best “conscientious approximations” (Spivak 2000). In following Gayatri Spivak “[t]ranslation is to transfer from one to the other” (2000, 21) and in so doing women’s narratives are open to interpretation and translation; meaning can be lost, and new meanings inferred or imposed.

Moreover, women in this study are not a homogenous group of “African women” or “women miners” but differ significantly amongst each other through intersectional factors such as socio-economic status, ethnicity, age and marital status (Yuval-Davis 2006; Crenshaw 1989). Nor are women in this study a “single monolithic subject,” an overgeneralisation that risks perpetuating women’s victim status (Mohanty 1988). The women in this study also represent a sample of participants, reminding us to question who can speak for whom and the implications that holds (Spivak 2015). Notably, the

women in the study cannot speak for all women working in extractivism, nor can I speak for all women miners or women in the region.

Lastly, while this study intersects with theories of social reproduction, defined as "the social processes and human relations associated with the production and maintenance of people and communities on a daily and generational basis, upon which all production and exchange rest" (Razavi 2013, 294), this is not a point of inquiry. A body of literature with theoretical analysis of ASM sites in Africa through the lens of social reproduction and in dialogue with this concept exists and has recently garnered increased attention (Kamundala 2025; Rushemuka and Côte 2024; Nkomo 2025). The current study seeks a different theoretical engagement and analysis of women's everyday gendered experiences along nodes of the 3T supply chain, not how value is produced, reproduced or defined along these sites. My approach centres agency, constraint, vulnerability, tactics and narrative.

With this overarching theoretical point of departure, we can begin to unpack how women make sense of their "everyday" social worlds, how they narrate their lived experiences in extractivism and what implications this has. This facilitates an exploration of if and how these narratives and "ways of operating" (Certeau 1988) contribute to shifting social worlds of work. Finally, I also engage with some additional and complementary theoretical works within individual chapters when relevant, for example in Chapter Four I discuss notions of social capital (Bourdieu 1986) which intersect with the broader theoretical framing of this dissertation.

Objective of Study

This dissertation has three primary objectives: 1) offer a unique contribution about women's everyday lives in extractivism, 2) enhance our knowledge of women's working contexts in downstream production roles, like mineral trade and transport 3) add nuance to existing scholarship on women in mining focused on Africa's Great Lakes region, to deepen our understandings of this emerging research topic.

This dissertation contributes to the emerging research agenda on women in mine work, which as scholars have noted is highly needed, since "the situation of women in relation to mining activities is currently under-recognised and under-theorised" (Jenkins 2014, 330). Even more recent literature on women in the extractive industries has called for an enhanced research agenda which aspires "to make visible the multiplicity of activities in which women engage within the artisanal mining sector, broadly defined, and the challenges they face with respect to sustaining their livelihoods" (Stewart, Kibombo, and Rankin 2020, 38). Even with an increased attention to women in mining, scholars have noted that studies about women in mines are frequently conducted in relation to other topics such as mining reforms (Iguma Wakenge et al. 2021). Less literature has centred women's perspectives or allowed them to guide the research process and subsequent theorisation. In addition, rather than examine the collective nature of life within ASM frontiers (Bryceson and Geenen 2016), this dissertation seeks to highlight the gendered and intersectional differences amongst mine workers, to better understand how these modifiers affect "the everyday" and broader social orders. There are also fewer female researchers conducting primary research in these settings, showing not only the gender inequalities in our sites of study, but also in our institutions of knowledge production.

As the literature review has shown, there is a significant gap in research on both men and women who work outside of mines in downstream production roles along mineral supply chains. While there are studies of male mineral traders, women's perspectives, beyond recognition of their presence, is largely missing. The dissertation seeks to address this significant lack. This study also adds to literature on women in ASM with a focus on Rwanda, which is less well studied than neighbouring DRC. It also fills a gap in literature on regional mineral supply chains (and supply chains more broadly) with a focus on women.

This dissertation provides a unique contribution in two ways. First, it includes women along the *entirety* of the mineral supply chain, including roles of trade, transport and mine ownership, through a broader conceptualisation of women working in extractivism. Secondly, by analysing women's lived realties and social worlds, we see how women

choose to narrate their place in extractive work, as well as how they seek to reframe and insert themselves into dominant narratives. This provides an original contribution and examination of women's lived experience through their own words and experiences.

Lastly, there has long been attention to the benefits of anthropological accounts of resource extraction as crucial for understanding globalisation, capitalist modes of production, indigenous and human rights, environmental considerations, state-community-corporate relations, matters of governance, place-based livelihoods and social movements (Godoy 1985; Ballard and Banks 2003; Jacka 2018; Zhouri 2017). There is no doubt that the contemporary dependence on minerals for day-to-day life has placed resource extraction and commodity chains at the core of modernity. This dissertation contributes to our understandings of the social dimensions and social worlds of extractivism, in this case with a focus on women. Here "the social worlds in which extraction is situated – and which are, to varying degrees, shaped by extraction – as well as the processes through which extraction materializes and comes to exist in these social worlds" (D'Angelo and Pijpers 2022, 4) brings to light important considerations in understanding contemporary extractivism and lived realities associated with global connection.

Dissertation Outline

This first chapter has provided the contextual overview, literature review and theoretical framing for this study. Chapter Two provides an overview of the methods used in this study and engages with ethical and practical considerations of conducting research in a context of everyday violence and conflict. In theorising "everyday violence" as violence beyond conflict, experienced through mundane daily occurrences, I problematise the research context as one of "terror as usual" (Taussig 1992), which cultivated a research context of fear for participants and for myself as the researcher. This impacted the methodology and epistemology of this study, and holds specific ethical considerations explored in the chapter. I argue that, despite this context, it is not a reason to deter

research but rather provides insight and anthropological perspectives to everyday life under constraint.

Chapter Three (en)genders the mineral supply chain. (En)gendering, which I employ as a play on words, is the notion of "giving rise to" and centring women's experiences in extractivism. The chapter starts by identifying what is meant by "nodes" of the supply chain, meaning the points of exchange when the mineral is put in motion. I describe the differing labour involved, locations and working dynamics at each node. I profile a female participant at each one of these nodes, from mines to the export route. This brings the supply chain to life and further describes where women are situated and what their working context is like at each node. Chapter Three further outlines women's roles in low- and high-income earning positions, and I map income changes across the supply chain. After this birds-eye view of the supply chain, I zoom into the details of extractive frontiers by first analysing how they are blended spaces of living, farming and extracting. Here we see that the supply chain is not linear but messy and complicated, which I discuss through an ethnographic profile of women who conduct mine work from their homes. In seeking to add texture to the working context of women, I describe and analyse the everyday rhythms of work in extractivism across the various nodes and linkages of the supply chain.

In Chapter Four I turn to a discussion of women's pathways into extractivist work, an important consideration given women's precarity in the industry due to the male dominance of mining and downstream production roles. In Chapter Four we begin to see how kinship and intergenerational influences affect women's entry to mine work and how they impact women differently from mine sites to downstream production roles. By exploring economic necessity and economic opportunity, I argue that women always have a choice to work in mining; however that choice is more limited within mine sites where profits are also the lowest. I further argue that women in downstream production roles require social capital (Bourdieu 1986) to access and succeed in extractive work. Contrary to this, women working at mine sites in extraction and processing enter mine work because of "negative social capital" (Wacquant 1998).

In Chapter Five I describe the gendered vulnerabilities and barriers to work that women face, which I argue foster various overlapping forms of extractive violences. I explore four categories (financial, physical, motherhood and toxicity) for which women experience exploitation, disposability and embodied violences. These violences are rooted in "extractive logics" (Murrey and Mollett 2023), premised on dehumanisation. In describing and analysing vulnerabilities, barriers and subsequent violences, Chapter Five also includes analysis of the gendered dimensions to power and authority. In DRC this includes discussion of how longstanding economic orders take on gendered dimensions and how in both countries, the law disadvantages women.

Turning to Chapter Six I analyse gendered divisions of labour and women's responses to them. Women are often blocked from high income earning positions due to traditional beliefs and gendered ideologies, surrounding notions of perceived physical strength. However, gendered divisions of labour are full of frictions and tensions and not experienced universally by all women. There were frequent instances in this study of women engaging in what was historically categorised as "men's work." This is strongly connected to regional dominant narratives of women as passive victims of sexualised violence and labour exploitation, which women strongly reject. In considering these tensions and frictions I discuss how the perception of women's work in mining is changing. I argue that there is a slow acceptance of women in extractivism, a change from their historic exclusion. In looking to downstream production roles, women were highly accepted by men (unlike female mine workers), described as transcending gendered binaries and "transformed" into men. Concluding this dissertation, I discuss the multiple and overlapping themes of this dissertation as well as answer the dissertation's central question, how do women make sense of their work in extractivism? How do women navigate the gendered dimensions of work in extractivism? Finally, I reflect on capitalist modes of production, in considering this dissertation's ethnographic contribution to understanding global supply chains through a gendered lens.

CHAPTER TWO: METHODS

> *"I know you said everything stays between us but that is not the case. In Rwanda, everything is listened to, everywhere. Even other higher up administrations [in the village] know you're here, but don't worry you are safe."*
>
> Male research participant in Rwanda, post-interview.

This statement was like many I heard in Rwanda relating to secrecy, silencing and surveillance during fieldwork. A female miner in Rwanda closed the window of her house as our interview conversation become more sensitive, saying "you don't know who you can trust. My roommate was a spy [for the government]." In DRC, mistrust also circulated. A Congolese NGO director once said to me "you shouldn't do research there [in Ngungu], people are not trustworthy." These quotes reflect the social realities and constraints under which this study took place, bringing to the forefront the specific methodological and ethical considerations that frame and underpin this research.

The broader context of this study is one of conflict and histories of conflict, which present specific epistemological, methodological, theoretical and ethical considerations. These factors affect both the methods – that is, how data was gathered, from where and from whom – as well as how the context contributes to the production of knowledge within and beyond this dissertation. As a multi-sited ethnography, I conducted research over 13 months, between April 2022 and October 2023, in North Kivu province of eastern DRC, Rwanda and Tanzania, including participant observation, semi-structured individual interviews and one focus group. The practical implications of conducting research in the shadow of conflict and a broader context of "everyday violence" provided both opportunities and limitations throughout the research process. These did not present in opposition but rather in dialogue and tension. My term "everyday violence" refers to the overt and subtle forms of violence experienced from living and surviving in contexts of violence and conflict. It also presents specific ethical considerations around safety and epistemological practice, which I problematise in the sections that follow.

This research was built up on my previous research in the eastern DRC with female artisanal miners in 2019, conducted as part of my Master's degree (Furniss 2021). With

the aim of deepening my research with female miners and expanding the scope of the study to include women in downstream production roles, I began this research with strong existing local and regional networks and contacts, which facilitated my access to fieldsites and informed the genesis of this project. While the research question between studies is different, a continued focus on women in mining allowed for the inclusion of some participants with whom I had worked before. It also provided the opportunity for many new avenues and aspects of women's experiences to emerge.

As highlighted in Chapter One, conflict in the region has a long history. DRC has seen more than thirty years of armed conflict, high rates of sexualised violence against women, human rights abuses and internal displacement. The 1994 Rwandan Genocide was a moment of horrific violence that continues to define the country, with varying degrees of violence and oppression continuing in its aftermath. The regional interconnected histories of violence and ongoing presence of armed conflict, especially in the border regions, have fostered a context of everyday violence. Again, this term refers to not only warfare and conflict but also the threat of violence, terror and subtle violence within the everyday. Given this context I ask, what methodological and epistemological implications does this have for the study? How does this affect women and myself, a female researcher, in this study? What are the interconnections between these two considerations? Some could argue that this context, one of conflict and everyday violence, makes the context too dangerous for anthropological or other research. Certainly, this question was raised by my ethics committee. I addressed it by arguing that with adequate safety planning, flexibility in research design and through my strong existing local network, successful research could still take place in this context. In order to protect participants, I designed the methodology following the lead and guidance of participants based on their comfort levels and knowledge of the local context. My research was approved by the University of Cape Town ethics review board, ethics clearance number EARC2021_27. This chapter argues that contexts of conflict and everyday violence, such as those in which this study unfolds, are not reasons to deter or dismiss research but rather create a site of complexity that can provide important insight into our understandings of lived realities and social worlds under constraint (Nordstrom and Robben 1995). Research in this context can be realised through flexibility in method

and practice, and mitigation and navigation of dangers through assistance from trusted local contacts. An everyday context of violence contributes to the world view and lived experiences of women who work in extractivism, affecting how they respond, act, narrate and experience "the everyday," within and outside their work. As I show, factors like fear, mistrust and silences are limitations in the study but also valuable points of inquiry into women's lived realities and broader geo-political dynamics.

I begin this chapter by first providing an overview of the study methodology, outlining the mechanics of this study, including an overview of the study location, timeframe, participant selection and other factors. I will then problematise the research context by showing how the idea of everyday violence enables us to bring into view the layered effects of histories of violence, extraction and conflict, with a focus on the tangible affects this context had on ethical and practical considerations in the field, as well as study limitations and opportunities.

Epistemology

This dissertation is a multi-sited ethnography (Marcus 1995, 2016) that "followed the people" and "followed the thing," and was therefore designed around different sites to explore connections amongst them (Marcus 1995). This research was guided by feminist epistemologies (Alcoff and Potter 2013) and rooted in reflexive practice with emphasis on the intersectional (Crenshaw 1989; Yuval-Davis 2006) aspects of women's daily lives. Feminist epistemologies call attention to *how* research is conducted and by *whom*, questioning the politics of knowledge production by centring critical reflection around representation, contradictions, differences, power imbalances, positionality and biases in research (Wolf 2018). This approach seeks to centre women's experiences, remains vigilant to difference, specifically situates this study and is in constant dialogue with potential power imbalances in research and the impact of the researcher on data collection. In order to centre women's concerns, perceptions and understandings of daily life and work, the methods of this study seek to highlight narrative, subtleties and detail, privileging subjectivity and challenging master narratives (Mama 2011; Nadar

2014). This enables more nuanced and thorough understandings of women's lived realities, privileging their individual perspectives and experiences rather than emphasising predetermined narratives.

My approach was to use participant observation, interview techniques and focus groups, all grounded in reflexive practice. Participant observation is distinguished by working and living alongside research participants, within their own everyday lives (Burawoy 1991, 2). In the study, this meant accompanying women throughout their daily activities, spending time at mine sites as women worked, conducting mine work myself alongside women and spending time with women in their homes when invited to do so. This method helped me gain an understanding "of how people act but also how they understand and experience those acts" (Burawoy 1991, 2). It also provided the proximity necessary to observe the subtilties and textures of "the everyday." I took daily fieldnotes, handwriting notes in a notebook during the day and typing fieldnotes each evening. In addition to observation, participant observation facilitated informal interviewing and conversations that provided much of the material in this study. I kept a field journal, separate from my fieldnotes, as a strategy to intellectually "leave" the field, or at least gain some distance from it, an important tool in my own reflexive practice.

My presence at fieldsites had an "observer-effect," whereby the presence of the researcher impacts the setting (Blommaert and Jie 2020, 27) and alters power dynamics. As a white woman, I was highly visible at mine sites, in villages and towns where this research was conducted. This provided me with a certain amount of power as a "guest" but also meant that I stood out, especially at mines, and often attracted attention from local residents, including local authorities, children, men and women. My presence (especially the first time I arrived at a new fieldsite) usually facilitated whispers, laughter and comments about the *muzungu* woman.[13] This visibility had an impact on the daily work rhythms of participants. While in some ways work would continue as normal, participants also changed their behaviour because of my presence, which affects what I observed and recorded and would have been different if I had not been there. For

[13] Muzungu is a Kiswahili word for foreigner, commonly used to describe white people.

example, when participants deemed it safe and appropriate, they would at times break their normal work rhythms to show me places or introduce me to workers and other people. In an example of this, a male shift supervisor in Rwanda took me aside to show me "memorial tunnel," while we were underground, where they had found dead bodies after the Genocide. These kinds of moments helped me gain in-depth knowledge of the working environment and history as well as afforded me a certain privilege and power to move freely and engage with mine workers. Over time, the curiosity of my presence in largely male-dominated and black African spaces decreased and people continued life as normal, decreasing my "observer-effect" (although it was never eliminated). My long-term presence at fieldsites and repeat interactions with observers and participants also increased trust, whereby some participants, who were initially sceptical of my presence and did not engage with me, became interested and curious over time. My positionality created a "place" from which I interpreted data and influenced how I saw and understood research experiences, how I recorded data and identified themes. As anthropologist Cliford Geertz points out, ethnographic methods are inherently interpretive as anthropology seeks meaning and understanding (Geertz 2008). In order to address potential biases due to my positionality, I triangulated information between participants, research assistants, local contacts, mentors and NGO's. I also discussed key research themes with trusted contacts and mentors to further verify my observations and analysis.

I conducted semi-structured individual interviews, with miners (male and female), geologists, village chiefs, relevant members of civil society, women in senior mine positions, female traders and mine owners. Interviews were conducted in many different locations including at mine sites while participants worked or while on breaks, at participants' homes (when invited), in public locations (such as restaurants) and at my accommodation. Interviews were conducted in the language of choice of the interviewee, either in English or French without translation or in Kinyarwanda or Kiswahili with translation. Individual interviews were organised in advance and followed a loose set of questions with a high degree of flexibility in the interview process (Davies 2012, 94-95). I emphasised reciprocity and structured interviews as much as possible as a conversation (Maruster 2013). This allowed for more in-depth discussion around sensitive or private information, such as participants' individual opinions about gender-

equality or politics, to experiences of violence. Although I was not asking questions about experiences of violence, the broader societal context made this a common point of discussion. This approach to interviewing further facilitated an interviewing environment with less interruptions and more opportunity for individual histories to emerge. The majority of these interviews were 1.5-3 hours in length. The shortest interviews conducted at mine sites were 30-45 minutes in length. I took handwritten notes in a notebook and immediately after the interview typed them up. Six interviews over the course of this study were recorded; I elaborate on the reasons for this low number below. These interviews have been transcribed and catalogued. Immediately following a recorded interview, I wrote post-interview reflections, noted highlights and a summary. Digital records were kept under a password protected laptop and handwritten materials under lock and key.

This study also included one focus group discussion with 20 women working together in a team at a mine site in Rwanda. I distinguish focus groups from group interviews as consisting of six or more people. A focus group engages participants in a facilitated conversation generating interaction between group participants (Maruster 2013). This fostered collective meaning, understandings and collaborative insight on a range of issues facing women in mining. A hot meal was provided, and this was organised at the mine site at the end of a shift before miners went home. I designed the focus group discussion from my observations at the mine site and based it on topics discussed in previous one-on-one conversations. This facilitated a form of scaling-up and expansion of information, opinions and experiences. It allowed for in-depth discussion and debate about relevant topics for them, including varying opinions and attitudes towards the mining company.

Fieldsites and Access

This study took place at multiple fieldsites across three countries, over three phases. The first phase involved three months of research in North Kivu province of eastern DRC. This

included nine artisanal mines surrounding the village of Ngungu in Masisi Territory and the provincial capital Goma. Time spent in Goma was primarily to acquire relevant local research permissions, a challenging and lengthy process which I will discuss below. In the villages, fieldwork focused on miners working at tantalum and tin artisanal mines, in open air mine sites with underground tunnels for excavation. Many of these mine sites were situated at a distance from the village of Ngungu, sometimes taking up to two hours one-way by moto (the colloquial term for motorbike, a common mode of transportation in the region).

The second and longest phase of research included nine months of fieldwork in Rwanda. This included two different export houses in the national capital Kigali and three different mine sites in three provinces. One of the export houses was locally owned and the other foreign owned. Both exported tin and tantalum. The three mine sites were owned by a single foreign company. They included one tungsten mine site and two other mine sites both extracting tin and tantalum. These mine sites used both artisanal and small-scale semi-mechanised extractive techniques. The final phase of fieldwork included one month of fieldwork conducted in Tanzania. This included overland export. With the consent of the driver, export house and transport company, I accompanied a shipment of 26 tonnes of tin, a four-day journey by truck covering approximately 1500 kilometres from the export house in Kigali, Rwanda to the national port in Dar es Salaam, Tanzania.

In DRC I worked with and was supported by an NGO, *Femmes Dynamiques dans les Mines* (FEDM), and a workers' collective, *Coopérative des Exploitants Artisanaux Miniers de Masisi* (COOPERAMMA), to access to mine sites. Initially I was not granted access to mine sites by either of the private companies working in Masisi at the time, including *Société Minière de Bisunzu* (SMB) and the newly formed Congo Fair Mining (CFM), previously *Société Aurifère du Kivu et du Maniema* (SAKIMA). This was largely attributable to my positionality as a white foreign female researcher and because of the remobilisation of armed groups, which I problematise later in this chapter. However, with the assistance of FEDM and COOPERAMMA I was able to access and conduct research within CFM mining concessions. The mine sites which I worked in had lower rates of mineral production than those found in Rubaya, the location of my 2019 research and a

more intensely researched area. While I could have conducted research in Rubaya with women miners without going to the mine sites, I choose to stay in Ngungu and engage in a more immersive research environment in smaller mine sites, despite their lower rates of mineral production but high rates of female participation. FEDM assisted with local research permissions and access to artisanal mines, as well as with introductions, security considerations and finding a research assistant independent from the NGO. Upon arrival in Ngungu (which was my primary base in Masisi and where some localised government offices are), we had a meeting with all local representatives of government offices (this are listed in the next section) and with the traditional authorities and other local stakeholders for localised research permissions, as well as an introduction and explanation of my research project. A summary of mine site governance actors (state and nonstate) can be found in Appendix Two.

In Rwanda I worked with the Rwandan NGO *Women in/and Mining Organization* (WIAMO), who greatly assisted with the national research permit process, local contacts, initial introductions and general guidance. Through my participation at Rwanda Mining Week 2022, an annual national conference for students at the University of Rwanda, private industry and government, I was able to foster introductions with private mining companies. Following this event, I approached a specific company based on positive introductions with the company CEO, who agreed to grant me access to their mines as a primary and more long-term fieldsite. The company was very accommodating and assisted in providing safety equipment, transport at the sites and full access to their sites and staff. I was required to sign a non-disclosure agreement (NDA), primarily in relation to business operations. Although outside of the legally binding clauses within the NDA, I experienced more subtle directives of silencing, where, for example, I was instructed by some members of upper management on what not to write or talk about. These sorts of directives contributed to the overall atmosphere of silencing and secrecy in which this study took place, where narratives are closely monitored and controlled, which I explore at length later in this chapter.

In Tanzania I worked with the University of Dar es Salaam department of Anthropology and Sociology. The head of department assisted with the research permissions process

and provided access to the university while I conducted fieldwork in Dar es Salaam. While conducting the overland trip from Kigali to Dar es Salaam with a shipment of minerals by truck, I made individual contacts at a private shipping company working in Dar es Salaam, who also assisted during fieldwork. For reasons of ethics, I have not named individuals here other than those listed in the acknowledgements.

All local partners assisted with research permits and the general administration between myself and host governments in conducting research in these varying settings. As mentioned, they also facilitated contacts with local mining companies and women themselves. All local host NGO's were led by local women who were strongly embedded in mining communities and amongst female miners. It was through these female leaders that I was introduced to participants and other organisations. As a result, female participants were often very open to meeting me and participating in the study, as the trust that was built by the women in my host NGO's was frequently extended to me. I am grateful for the prior networks of work that made my own possible.

Ethics

This research was approved by the Department of Anthropology and Faculty of Humanities at the University of Cape Town. It followed the University of Cape Town *Faculty of Humanities Guide to Research Ethics Research with Human Participants* as well as Anthropology Southern Africa *Ethical Guidelines and Principles of Conduct for Anthropologists*. In Rwanda, research was approved by the National Council for Science and Technology, permit number NCST/482/352/2022. In Tanzania, research was approved by the Tanzania Commission for Science and Technology, permit number 2022-943-NA-2022-269. The Congolese government does not have a centralised research permissions process for local or foreign researchers. Each individual researcher, university or NGO can decide for themselves what constitutes appropriate research approvals nationally. In DRC, therefore, I acquired research permissions from seven state institutions including: the Governor of North Kivu province, the provincial Minister of Mines and Finance, the Mining Branch, SAEMAPE (*Service d'Assistance et*

d'Encadrement des Mines Artisanales et à Petite Échelle), COOPERAMMA (an artisanal miner's collective), the national police and territorial authorities.

As is clear from the multiple partners, people and processes highlighted here, the fieldwork research for this project required an enormous amount of administration, with high costs and long waiting periods. In Rwanda the entirety of the research permit approval process, from initial meetings to finally being granted the permit, took ten months. After waiting eleven months for the outcome of my application for my Tanzania research permit, I had to physically go to the office of the National Council for Science and Technology in Dar es Salaam to follow-up in person on the permit, which had been approved but whose outcome had not been communicated to me. In DRC the inconsistency and arbitrary process made it very difficult to navigate. For example, my research in the same place in 2019 had required five approvals but by 2022 required seven. This speaks to some of the practical barriers of fieldsite access (perhaps more pronounced for foreign researchers) and the subsequent effects on academic work produced from and about the region. Not all graduate students would have been able to wait ten months for a research permit or travel to the host country to follow-up on the research permit process.

Consent was primarily acquired through verbal means. In cases where participants spoke French or English, I explained an overview of what the research was about and what it would be used for, what participants were consenting to, how they could contact me if they wanted to rescind consent and how I would protect their identity and participation. In cases where participants preferred Kinyarwanda or Kiswahili, this information was translated by a research assistant. I also provided research information sheets and consent forms (when deemed appropriate) in English, French, Kinyarwanda and Kiswahili, depending on the participant's preference. In cases where participants were illiterate, as was frequently the case amongst DRC miners, the project and consent were explained verbally through translation by a research assistant.

Participation and Research Assistance

In total 133 people participated in this study. 103 of these participants were miners, eleven worked at export houses, nine participants were in high-income earning positions, eight were involved with workers collectives, and two participants worked along the mineral export route. Participants were recruited primarily through snowball sampling after initial introductions facilitated by NGO partners listed above. While most participants were women, I also interviewed some men. All participants were over the age of 18 and all gave consent to their participation in the research and use of the data.

I use pseudonyms throughout, even when participants consented to being named. Pseudonyms were also used in all fieldnotes and data capturing. Although the mining company and export houses in Rwanda consented to being named in the study, I have chosen to keep them anonymous in order to protect the identity of participants. This is because there are few women in the more specialised positions, and naming the organisation would make them identifiable. No participant was renumerated, although in some cases I provided refreshments and snacks during semi-structured interviews. In cases where I was very close with participants, I provided a thank you gift at the end of the fieldwork period, most frequently electronics, like solar chargers, or luxury goods, like perfume. This was an effort to address what ASnA (Anthropology Southern Africa) terms "fair return" in research engagements.

In both Rwanda and DRC, I worked with a local female research assistant. Although I did take language classes while in the field in both Kiswahili and Kinyarwanda, I required research assistance primarily for translation. Both women preferred to remain anonymous and as such are not named in this dissertation. While co-authorship in an important step towards decoloniality in research, both research assistants approached the position strictly as a job, holding differing career aspirations and were not interested in co-authorship. Neither of these women worked for or were affiliated to the NGOs I worked with. My research assistant in DRC was a Congolese woman aged 28 who had a university degree from North Kivu. She is fluent in French, Kinyarwanda and Kiswahili. In

Rwanda I was assisted by a 26-year-old Rwandan woman who had a university degree and worked as a teaching assistant. She is fluent in English, French and Kinyarwanda. These positions were renumerated monthly at a rate commensurate with local standards. While their role emphasised translation, these women were in many ways also "superinformants" (Schumaker 2001, 198), who provided explanations of local behaviours, assisted in breaking down the meaning of phrases and words, and provided other insights into contextual and cultural practices. They also added to informal interviews, sometimes initiating questions or conversations and in navigating challenges that arose while in the field. This was very valuable; it also means their lens and individual positionality impacted the study as it informs how participants engaged with them, with me and the subsequent data collection (Schumaker 2001).

In DRC research was conducted in French and where necessary, with translation from Kiswahili and Kinyarwanda. In Rwanda, research was conducted in English and French, with translation from Kinyarwanda as necessary. Fluent in French and English, I conducted interviews directly with participants who spoke either French or English, without research assistants present. Translation poses a limitation in this study since some meaning can be lost through the act of translation and some words or phrases are untranslatable, holding multiple meanings with complex etymology (Englund 2024). To address this, I triangulated the translation of words and phrases that were of particular importance with at least two other native speakers (usually NGO contacts or mentors). I also conducted interviews myself as much as possible. In order to avoid mistranslation, I conducted a one-day training one-on-one with each research assistant. This training emphasised the role of *interpreter* not respondent and explained the importance of translating verbatim. This was an important strategy to avoid instances of mistranslation, where in some cases poor translation has caused research to (almost) fail, calling for major changes in method (Volkova 2019), or in extreme cases, instances where assistants mistranslate intentionally (Schumaker 2001, 196). With this overview of the study mechanics, I turn to a discussion of the broader context of constraint under which this research took place.

On Anthropological Research in Contexts of Everyday Violence and Conflict

« Ici au Congo, on est née dans la guerre, on grandit dans la guerre et on meurt dans la guerre ! »
[Here in Congo we are born in war, grow up in war and die in war!]
Female research participant in DRC

The opening quote in the introduction of this chapter, as well as the one above, begin to shed light on the broader context of violence and conflict in which this study took place. While the sections above have highlighted the mechanics of this study, these practical aspects of conducting the research cannot be removed from the broader research context, one of "everyday violence." What is meant by "everyday violence?" Carolyn Nordstrom and Antonius Robben argue that violence exists beyond war and conflict to include "everyday violences," as extended and more subtle forms of violence experienced from living and surviving in contexts of violence and conflict (1995). They argue that violence is culturally constructed and there is no one "thing" called violence, rather that violence has multiple mechanisms and many "layers" including, military (warfare), psychological (fear and anxiety), political and intellectual dimensions (1995). Their conceptualisation of everyday violence emphasises sociopolitical violence, as "…the everyday, the mundane, and the not so mundane spheres of life that are the social field of violence expressed-the targets of terror, the templates on which power contests are carved, the fonts of resistance, and the architects of new social orders and disorders" (1995, 5). By conceptualising violence as a "dimension of living," it importantly includes things like the threat of violence, political oppression through non-violent means and micro-aggressions, amongst other factors (1995). It also makes clear that there is no simple binary of "violent" versus "non-violent" situations in such conditions.

In her ethnography of a disadvantaged community in Brazil, Nancy Scheper-Hughes provides a pertinent example of how everyday violences can manifest (1992). She discusses the effects of the Brazilian government's tact of disappearances against anyone deemed an "agitator," including political opponents, academics and the poor, between 1964-1985 under military dictatorship (1992). She argues that the collective and individual fear of the possibility of "being disappeared" or having a loved one disappear,

fostered a form of state terror amongst her research participants, creating conditions of everyday violence. The circulated knowledge and gossip of such incidents formed the backdrop of everyday life in Brazil, which rooted fear and terror as foundational experiences to everyday life (1992, 229-230). In this example, the people and communities she described may not (yet) have experienced physical acts of violence, but the constant threat of violence created a modality of violence within the everyday which, in her example, manifested as terror. This context can have negative physical and psychological impacts on populations experiencing this, as well as contribute significantly to broader societal silencing and mistrust.

Similar incidents occurred during fieldwork for this study. In early 2023, a Rwandan investigative journalist died under suspicious circumstances. He was described as "the only journalist who dared report on issues of political persecution and repression" (Watch 2023). His death was officially attributed to a road accident but was widely perceived as an act of violence at the hands of the state, although the government denied any involvement. This incident was widely talked about in whispers and follows many other widely known incidents of death under suspicious circumstances, suspected to be committed by the state.[14] Scholar of Rwanda Filip Reyntjens (2011, 2020) has written about suspicious deaths, disappearances, harassment and official bans of Rwandan officials, political opponents, human rights activists, journalists, academics and anyone expressing dissent (including himself). This has occurred as the strategies of the Rwandan government to silence opponents have become more widely discussed and publicised. Across the border in neighbouring Goma, DRC, there have been academic publications discussing arbitrary detention and torture of NGO workers and civil society activities, where state officials perpetrating these crimes directly stated that the arrests were meant to scare people (Longman 2013, 255). For anyone in advocacy work, politics, human rights protection or research (regardless of the topic), the death of the Rwandan journalist and knowledge of similar events signalled the threat of violence, contributing to a broader culture of fear and mistrust.

[14] For example, see: Watch 2020.

While my positionality as a white foreign researcher is very different from a black Rwandan journalist or Congolese civil servant, signalling a different type of threat (most importantly, my research participants could be at higher risk than myself), I was also aware of historic incidents where white foreign researchers faced silencing at the hands of the state. Academics have written about experiences of attempted government control over research findings and narratives more predominantly in Rwanda, for example, noting that "[t]he current government seeks to exert as much control as possible over researchers working on sensitive or political topics. The ruling Rwandan Patriotic Front (RPF) goes to great lengths to ensure that foreign researchers and journalists do not question its restrictive narrative about Rwanda's recent history or write anything that tarnishes its carefully crafted positive image" (Thomson 2013, 140). This has included less severe constraints like intentional delays in acquiring research permits and unethical government requirements to handover research data (Longman 2023). However, in more severe cases it has included the rescinding of research permits, halting of research, demands to hand over lists of participants, house raids for research material, passport confiscation, house arrest (Thomson 2013, 2009, 2011) and intimidation of research participants (Begley 2009).

My knowledge of these types of incidents loomed large given that my research topic involves so-called "conflict minerals," a sensitive topic. As discussed in the previous chapter, it is an industry with a significant amount of secrecy and illegality. While my research focuses on the lived realities of women who work with 3T's, not smuggling or other illegal activity in mineral extraction, these topics are interrelated. I also needed to understand the intricacies of the minerals' "social life" (Appadurai 1988), where women, the mineral and the extractive context co-construct the research context. For this reason, it was also important for me to understand the details around traceability, mineral extraction techniques, mine ownership and other details about mining that could be deemed "sensitive." Participants also shared sensitive information, unprompted, due to the broader research context and how it manifested in their everyday lives. More than simply good anthropological practice to use pseudonyms in fieldnotes and data capturing, it was for these reasons that I never used participants' real names,

anonymising all participation through the use of pseudonyms and codes in data collection and analysis.

At the root of terror is fear, and fear is a response to a perceived danger. However, fear is an elusive concept; as anthropologist Linda Green notes, it is not always visible but can be overwhelming for the person experiencing it (1994, 230). Green theorises how, under military rule, fear became a way of life in Guatemala. She suggests that fear is not an acute reaction but becomes part of a chronic condition, part of broader social memory (1994, 1995). She notes that fear divides communities and people, destabilising social relations. Fear exists not only between strangers but within kinship networks, and amongst friends and neighbours (1994). She further states that "the invisible violence of fear" (1994, 227), manifests through the choices people make and reality in which people live. Fear was a strong theme in the narratives of women in this study. Fear of men, fear of authorities, fear of certain extractive work, fear of the mining companies. Men also expressed a fear of women working in certain roles or in certain mine spaces, such as underground. However, fear and mistrust also provided opportunities for women. A pervasive and generalised lack of trust for anyone outside of kinship networks created opportunities for women to work for family members who already worked in the extractive sector because they were seen as trustworthy. The idealised linking of kinship and trust created the conditions for labour in an otherwise difficult area. In this context, women also held power through the ability to exploit the fears of others within his broader fearful context. Here tensions start to arise in how we can understand fear's impact on choice and daily life.

In building on fear and terror as a function of the everyday, Michael Taussig puts forward the notion of "terror as usual" in his work, The Nervous System (1992). Inspired by the work of Walter Benjamin who argues that a "state of emergency" can become the norm rather than an event, Taussig argues that the current system(s) under which we live (primarily focused on state systems) are tremendously violent, fostering a "Nervous System." The Nervous System refers both to the systems of societal order, where these systems (for example state apparatuses) create a nervousness, and where the lived experiences of these systems create a nervous state of living, producing a system of

terror (1992). Taussig asks, what happens when a "state of emergency" in the everyday is the norm? He, like Scheper-Hughes and Green, also discusses how death squads in Columbia, South America foster silencing and fear through disappearances of political opponents. In clarifying the consistency of the state of emergency, which Taussig argues characterises the contemporary moment in which we live, he states:

> "[t]his understanding requires knowing how to stand in an atmosphere whipping back and forth between clarity and opacity, seeing both ways at once. This is what I call the optics of The Nervous System, and while much of this is conveyed, in a typically oblique manner, in the notion of the normality of the abnormal, and particularly in the normality of the state of emergency, what needs pondering....is the violent and unexpected ruptures in consciousness that such a situation carries" (1992, 17).

What I'm referring to as everyday violence and what connects this research with Taussig's conceptualisation of "terror as usual" (1992), is a daily experience of violence through the cultivation of terror, uncertainty, disorder and fear. For research participants this emerged in various ways, not all commensurate but layering over one another. It might be through living in a context where armed groups could arrive or take over villages at any moment. Or living in fear of male managers, with many women having reported instances of harassment or being forced to leave their jobs; the effect of this was to normalise the everyday violence of exploitation and the loss of livelihoods. While armed groups remobilised in eastern DRC during the fieldwork of this study, the fighting always felt 'far away' in other villages or locations, even if looming nearby; the result was a greater emphasis and more pervasive experience of everyday violences in this study. Everyday violence permeates the lived experiences of women more consistently, as a haunting and embodied experience. Here we begin to see "terror as usual" (Taussig 1992).

This context in turn affected the worldview of participants and their choices. It also affected participants' interactions with me, what was shared or omitted during interviews and how relationships were formed. For example, for participants an experience of violence or the threat of violence could be considered so mundane they do not recount

it, while for the researcher such experiences can provide valuable insights and lines of inquiry. While I discuss the strategies I employed to address this below, “terror as usual” had methodological and epistemological implications. In sum, these forms of everyday violence form the backdrop of everyday life in this study, which not only exist through direct circumstances of living amongst conflict and war, but also through the threat of violence and a broader culture of fear, mistrust and silencing. This impacts the lives of women and subsequent social worlds explored here, as well as the ethnographic encounter between myself, the researcher, and participants.

“Terror As Usual”: Methodological and Epistemological Considerations in The Field

What I have described above is a pervasive sense of fear that animates the social worlds of participants in the aftermath of genocide, histories of conflict, violent forms of extraction, armed insurgency and complex regional dynamics. This research context raises the question of how one can conduct research ethically and safely in such an environment? Carolyn Nordstrom and Antonius Robben argue that the lived experiences of violence (referring to those experiences of research participants and researchers) cannot be separated from epistemologies of violence, rather calling for ways to understand how violence permeates a research context and the implications this has for subsequent knowledge production (1995, 4).

The culture of everyday fear and terror that I just described, also had an impact on me, as the researcher, and on subsequent data collection and analysis. The ethnographic encounter is an exchange between people – it exists through the encounter. The “terror as usual” that I experienced also impacted how I interacted with participants. Just as participants may have been sceptical of me, I was at times sceptical of the intentions of participants. Over the course of fieldwork “terror as usual” became very normalised for me but also cultivated a deep generalised fearfulness and a quality of paranoia during fieldwork. For example, a colleague in Rwanda once said, “I think the government is following us,” while giving me a lift one evening; later it was determined that we were not

being followed, although we were never completely certain. In the most affecting of incidents, in early 2023 I experienced a strange laptop crash, which made me incredibly anxious about, even paranoid, of cyber surveillance, fostering an extreme fear of my digital devices. In returning to my fieldnotes and field journal after fieldwork, I realised that this fear and paranoia was so pervasive and silencing, it resulted in a near complete omission of any mention of it in my fieldnotes, despite its presence in my everyday life. I also only wrote minimally about it in my field journal, an offline and highly personal tool for reflexivity during the research process. I wrote in my field journal:

> *I feel extremely stressed by cyber security in Rwanda and how much the surveillance state has scared me – does scare me….I have been feeling really unwell, off-balance.*
>
> Entry from field journal, 23 June 2023.

> *A place [referring to Rwanda] that looks and feels beautiful, comfortable and safe for one person, can be a place of fear, paranoia and anxiety for another person. The beauty of Rwanda has disappeared. I'm always looking over my shoulder.*
>
> Entry from field journal, 28 August 2023.

Ironically, in seeking to study the women who contribute to the fabrication of digital devices, my own digital technologies which enabled this research became devices of fear, terror and silencing. While this study seeks to privilege and centre the experiences of women who contribute to the eventual production of devices, the devices their labour enabled produced silencing affects for me, down the chain of knowledge production. The sophistication of modern digital surveillance technology created a constant suspicion and mistrust around who had access to my devices, even when password protected. Historically, foreign researchers in Rwanda have gone to great lengths to safeguard against digital surveillance, including crossing the border to Goma just to send e-mails, knowing that the government of Rwanda surveils and intercepts digital communications and phone calls (Begley 2013). However, the fear I felt went beyond interception of emails to screen mirroring and access to files; digital spyware can carry out these activities remotely, creating new dimensions and considerations for digital data protection. Spyware such as Pegasus, an Israeli made cell phone spyware technology, is known to

be used by the Rwandan government against journalists and political opponents.[15] My fear did not stem from the topic of research, how I conducted research or even that sensitive information was at times shared with me, but rather was largely attributable to the broader research context of silencing and arbitrary control of narratives. This fostered a deep fear of "what if?" despite taking measures to protect participants and myself.

The result of this broader context of terror, mostly due to perceived state surveillance, is the emergence of biopower within the methodology and epistemological spheres of this study. Here power, as explored in the theoretical framing, also impacts the mechanics of the study itself. Biopower, as conceptualised by Foucault, is largely a hidden power relating to behaviours. It exists through knowledge (Foucault 1980). Biopower is an influence that applies not only outward to the lived experiences of participants and their responses to it, but inward on myself and the study itself. The knowledge I held about forms of state surveillance (whether real or perceived) created a form of violence (through terror) for me, which changed my behaviour – a defining feature of biopower – through self-policing.

Adapting to a fear of my digital devices and in order to protect the identity and anonymity of research participants given this threat, I increased my use of handwritten notes, keeping them under lock and key. I also increased face-to-face interactions, limiting cell phone use to coordinating logistics. I used symbols and codes in my fieldnotes and started completely omitting certain topics (such as any fear that I felt personally). Self-silencing became second nature. Here we see the techniques through which biopower is realised and terror normalised in everyday practice.

Throughout this study, participants and I feared any kind of record keeping (including the use of consent forms) in participation, fearful of where these records could end up – even when taking utmost precautions to keep data and participants safe, anonymous and confidential. I recorded very few interviews in this study. Two of six recordings were in Rwanda, which I deemed important for archival records, and the remaining four were

[15] For example, see Reynaud 2024 and A. International 2021.

conducted in DRC with dignitaries who did not fear recordings, due to their community stature.

Mistrust also permeated how people saw me. As a white foreign researcher, I was frequently accused of being a spy, whether for government(s) or private industry. While seeking permission from a private security company that escorts shipments of minerals from an export house in Rwanda to Dar es Salaam, the lead security agent looked at me and asked, "Are you a spy?" After a long discussion and presentation of my research permit and other government permissions, I was still not permitted to go with the shipment. In another example, after a meeting held in order to introduce myself and my research to local leaders and mine authorities in the village in DRC, my research assistant said to the group, "Please explain to women you work with that Allison is a researcher and not a spy. You can support her by making it clear what she is doing here." The broader political tensions between Rwanda and DRC at the time of fieldwork also directly affected my access to fieldsites, rooted in "the spy" narrative. After being denied re-entry to DRC at the end of 2023, despite holding a valid entry visa, I successfully returned to Goma a few months later without incident, discussing the situation with local mentors and later writing in my fieldnotes:

> *They [mentors] both said to me that they thought it was a "bad moment" or "bad timing" the last time I crossed. M23 was advancing on Goma, and it was just politics. [Mentor 1] and [mentor 2] both said the same thing. They both thought that when the DGM [the border agents] saw my passport with a visa for Rwanda and Congo, they [the border agents] immediately denied my entry, thinking I could be a spy [for Rwanda].*
>
> Fieldnotes, 10 November 2023, Kigali.

Social scientists have recounted similar experiences of being labelled a "spy" in DRC (Vlassenroot 2006, 197). Anthropologists doing research on minerals and mining in DRC have noted broad instance of mistrust amongst participants working in the sector, regardless of whether they worked legally or illegally, and even when working with trusted local contacts (Mantz 2018, 534). I had all the necessary permissions to conduct research, so the suspicions I am reporting here are rooted in a context of pervasive fear

and mistrust and not in my conduct. Academics have noted that while this type of suspicion towards researchers can be dangerous, it is also common and is expected, given the broader history of anthropology (Sluka 1995). Some people or communities may be unfamiliar with what an anthropologist is and as a result categorise researchers in more familiar terms like journalists or spies, as well as (understandably) approach anthropologists with scepticism (Sluka 1995, 283). Anthropological research and approaches have been used in covert ways, commissioned by governments or private industry, harming communities.[16] In Rwanda in particular, anthropologists and academics were a part of the creating of colonial era ethnic hierarchies, justified through so called "racial science," contributing to ethnic divisions, tensions and contributing to the 1994 Genocide (Des Forges 1995; Newbury 1998). Furthermore, the mining sector brings with it an additional layer of secrecy and as a result mistrust towards researchers, from participants and private industry. As mentioned in the introduction miners and traders sometimes work illegally, and participation in research could expose them. Mining companies are also often secretive around business practices, from human rights and health standards to profits and exploration projects.

In order to navigate and address these considerations, and in applying feminist epistemological practice, I emphasised honesty and transparency with participants and partner NGOs, particularly noting that I conducted research in both countries. I fostered attention to potential biases and contradictions and spotlighted where I was doing research and how. I was frequently asked by participants if I conducted research in other countries or settings, to which I always replied "yes" and shared details of those experiences, including the sharing of previous academic publications when relevant. Although researching in both Rwanda and DRC did negatively affect my access to fieldsites (as described above at the border in DRC), amongst participants it often fostered intersubjective openness about people's opinions and lived connections

[16] For example, in the construction of the Chad-Cameroon oil pipeline, the World Bank and private industry hired an anthropologist, Ellen Brown, to conduct animal sacrifices when the pipeline construction destroyed sacred sites, in an effort to include "local knowledges." However local residents expressed unhappiness with this practice and the pipeline largely destroyed local livelihoods, ecologies and exacerbated poverty, whereby scholar Amber Murrey notes that the "ceremonies pacified a measure of the public outrage over the destructive and dispossessing components of development projects" (Murrey 2015, 66). See also Useem 2002.

between the two countries, much to my surprise. For example, in Rwanda after discussing my parallel research in DRC, a mine staff member told me with a laugh, “Oh yeah, there [at mine site in Rwanda] they used to buy minerals from Congo and export them but then they found [mineral] there and stopped!” In another instance, a male participant in Rwanda exclaimed “You research in Congo? In Congo they will eat you!” a startling comment which he followed up by sharing his opinions about regional conflict and violence. A female participant at an export house in Rwanda explained her family connections to North Kivu and her fear of the province. A mine site engineer in Rwanda told me about his wife’s business illegally smuggling shoes from DRC to sell in Rwanda when we spoke about my research in both countries. Although it was never directly communicated to me, my transparency likely deterred some research participants who distrusted my efforts. Both of these factors, the deterrence and intersubjective openness, affects the data collected. Intersubjective openness added and enhanced information, depth and perspectives in the study in unexpected ways. On the other hand, deterrence may have turned away some participants, excluding (although not intentionally) some voices. My visibility throughout the research process increased my personal safety while in the field; “being seen” was an intentional strategy to keep me safe, so as not to be perceived as conducting clandestine research.

What I seek to highlight here is that the broad culture of fear and terror had permeated my own consciousness, my behaviour, my way of seeing and interpreting fieldwork, how I engaged with participants and how they engaged with me. To this end and in echoing a feminist anthropological perspective, “the text cannot exist independently of the subjective conditions through which it is constructed” (Nencel 2014, 76). My own experiences of fear and terror, as well as positionality, cannot be separated from this research but should not be read as an indication of lack. Rather, I have tried to show how my own experience mirrors those of participants, giving rise to a sense of how fear is normalised.

In considering how the research environment affected me and subsequently the methods, I was reflexive on the ethical considerations that emerged, particularly as it pertained to the safety of research participants. For example, the opening quote for this

chapter was a warning but also a reassurance. After that interview I wrote in my fieldnotes:

> *I felt a bit of anxiety after that. Should I be more careful? Or am I already too paranoid?*
>
> Fieldnote, 5 April 2023, Kigali.

In a haze of self-doubt, throughout fieldwork I was continuously asking myself, how can I keep research participants safe in such a context? I took some tangible steps to increase protection of participants in data capturing, as described above. I also interviewed people one-on-one in private spaces as much as possible and in their location of choice, most often after having met previously. Even in public spaces, for example restaurants, we would sit out of earshot of other people. To further safeguard participants specifically in Rwanda, I am not including the name of the mining company or export houses, nor including the specific locations of the mine site the country, while also, at times, excluding the name of the specific mineral being mined, since it could identify locations and subsequent companies and participants.

Walking Softly: Strategies for Conducting Research Under Constraint

While research in conflict settings and contexts of everyday violence present distinct methodological and ethical considerations, research in these environments is possible, despite the "conventional academic argument that insecurity makes it impossible to secure valid data" (Goodhand 2000, 8). Koen Vlassenroot, who has conducted decades of social science research in eastern DRC, argues that research can be successfully conducted in conflict prone areas when researchers have strong local networks, remain flexible in methodological practice and have deep understandings of localised conflict drivers (2006). Similarly, Jeffrey Sluka, who conducted research with armed militia in Northern Ireland, defends the ability to conduct research in dangerous environments, which he argues can be done successfully through proper planning, foresight and "skillful maneuver" (1995). He notes that it is especially important for researchers and

universities not to be swayed or influenced by overexaggerated media, biases, stereotypes or inadequate information about "dangerous" fieldwork settings, rather arguing that anthropological research is required in these environments and should not be abandoned (1995). The work of Carolyn Nordstrom and Antonius Robben reiterates the need and benefit of anthropological research in violent settings, since they outline violence as an everyday experience, which can only be understood properly when ethnography and ethnographers are placed in these contexts of violence, while considering the specific ethical, safety and methodological considerations in these environments (1995). In considering broader environments of everyday violence and fear, scholars have argued that in these contexts, limited freedom of speech and potential selective telling can be understood as "data points" rather than "data problems," and can help us better understand complexities and nuances in the research environment and broader society (King 2009).

In approaching fieldwork through this lens, I strove to "walk softly" (Sluka 1995, 287) in how I approached the field and in my interactions with participants in all contexts. In order to build as much trust as possible with participants in this research environment, a foundational methodological element of anthropological research, I followed the lead and guidance of participants as much as possible and was reserved in my initial questioning. In following the words of sociologist Ned Polsky when conducting research on sensitive topics to "…initially, keep your eyes and ears open but keep your mouth shut" (2017, 126-127), as the researcher it was vital for me to reserve initial questions until I had a better "feel" for the research environment and what topics could be considered sensitive, as well as to not intimidate participants.

I was especially reserved in approaching women in Rwanda because of the broader culture of secrecy, not only because of the surveillance state but also because secrecy has a long and embedded history in the country. Anthropologist Danielle de Lame has written about the importance of secrecy for rural residents in Rwanda in identity formation, ritual and cultural practice, where "secrets are a preferred tool for forging an identity, both induvial and collective" (Lame 2005, 14-15). Despite these warnings, however, I experienced many instances where women were willing and eager to

participate. For example, in Rwanda while working underground, a young woman I was working next to said “I want to talk to you! Ask me some questions!” Women also approached me to participate, and in DRC on several occasions women came to my accommodation requesting to participate. I also conducted a radio interview while in the village with a local radio station in Masisi, introducing myself to the community. During this interview three members of the public called in, including one woman who requested to participate and whom I subsequently interviewed. This reiterates the argument by other academics that research in conflict and violent settings can yield (at times surprising) intersubjective openness (Longman 2013). Local participants can perceive “outsiders” as in a safer position than themselves to disseminate sensitive information and may seek participation in research as an act of defiance to systems or policies people do not always agree with (Longman 2013), or simply as an opportunity to be an expert, to share experience or to engage across difference. Especially when interviews are conducted more informally (for example over a meal or in women’s homes), participants are often much more open than may be assumed given broader contexts of fear and mistrust.

While trust was not easy to build in this research context, the ways in which women engaged with me reflected that sufficient relationships had been formed to provide a basis for shared conversations, something my research assistant confirmed. The types of topics women were willing to discuss with me and the experiences they were willing to recount reflected trust. For example, although it is illegal to discuss ethnicity in Rwanda, women would at times spontaneously share their ethnicity with me out of pride, in explaining cultural traditions or when recounting family histories that included experiences relating to the 1994 Genocide. In trying to walk softly in research and build trust, I also relied heavily on reciprocity, largely experienced through a reverse analytic gaze, where participants felt comfortable to also ask me questions, in a two-way conversation. Participants frequently expressed curiosity about my life, asking if I was married, if I had children, where I was from, what religion I belonged to, where I was living, what I was studying, what I thought about crime in South Africa and what I thought about Rwanda. These conversations and the reverse analytic gaze always took place before I would ask participants the same kinds of questions.

Where interviews were conducted was also of upmost importance. In moments of informal interviewing during participant observation, I was mindful to find private spaces (even in underground mining tunnels) and was reserved in what I asked when other people (male or female, miners or nonminers) were able to overhear, often ending or pausing interviewing prematurely and following women's lead in conversation. This manifested in different ways. During an interview with a woman in an underground mine tunnel in Rwanda, we discussed her reasons for entering mine work away from the rest of her team, having lagged behind the group while walking between locations. While stopped and talking, a male miner walked past. She immediately stopped talking when we saw him approaching and only continued once he was out of sight. In another especially open and in-depth interview in Rwanda with a participant I had built a strong relationship with over several months, the interview took place while we sat alone in an underground tunnel waiting for her team to set up for the shift, above the dive where they worked and far from the main tunnel, 1km underground. In semi-structured individual interviews that were planned in advance, the participants chose the location, most often in a private corner of a restaurant, their home or at the mine site. Interviews most frequently occurred after repeat interactions and interactions with women beforehand. These practical steps, considerations and attitude were part of my efforts to walk softly in method and practice.

In order to address safety concerns, flexibility in my research methods, practice and even location was a dominant strategy within this study, to adjust to a shifting security environment while continuing field research. Heightened threat of conflict at the hands of armed groups in Masisi, incidents of increased violence in Goma, such as the 2022 anti-MONUSCO (UN peacekeeping mission in eastern DRC) protests and increased generalised insecurity, blocked my access to some fieldsites. Not only was I, at times, physically prevented from accessing hard-to-reach fieldsites but, as already discussed, the broader geopolitical tensions and insecurity produced a fearful and paranoid environment, enhancing mistrust of researchers, also created barriers to access. It is not uncommon in eastern DRC to face restricted movement, making fieldsites difficult to reach, notably since researchers tend to work independently not connected to or

protected by international organisations like the UN (Smith 2021, 10-11). As a result of growing tensions in the broader Kivu area, I pivoted this research to Rwanda sooner than planned and spent much more time there than originally intended. For this reason, this study includes more ethnographic data from Rwanda than DRC; in some cases, data is missing from DRC, for example voices of female Congolese mineral traders, as I was blocked from accessing the fieldsite required to interview them. Due to the topic of study, overall anthropological approach and, as discussed, research context, interviews via phone or online platforms were out of the question. Beyond the security considerations, this shift further reflects anthropologist James H. Smith's observation that anthropologists do not define their fieldsites, and they work in environments they do not control (2021, 10). By working with local NGO contacts in both countries and relying heavily on previous research contacts in DRC, I was able to work closely with trusted local networks and mentors throughout the research period, who advised me on safety considerations and other practical aspects of fieldwork. Having conducted ethnographic research in DRC in 2019, I was familiar with the research environment and could include a strong safety plan, including an evacuation plan, which I updated regularly throughout fieldwork. The triangulation of information was also a strategy I employed to enhance the research methods in the study, keeping method and practice as robust as possible. By discussing select topics (from research topics to questions of the local security situation) with many different participants, research assistants, NGO contacts and others, I was able to adapt the research methods and reduce inconsistencies and risk in research and practice.

However, the reality of the research context in which I worked meant that I was not able to do anthropological research in a "traditional" or perhaps romanticised way in which I imagined before fieldwork. I imagined an ethnography where I lived with women long-term in mining communities, working in mines with them and building rapport, where we all gossiped together over lunch. This was just not possible. Although I worked very hard to build relationships with participants and sometimes, I also had to resign myself to the fact that some interviews were with women I had just met or had only met a few times before, with whom I had no "rapport." Expecting to write "thick description" (Geertz 2008), as an aspiring anthropologist this experience was shrouded in shame. I asked myself if I

was even doing anthropology? The reality is that our research environments and social contexts take precedence over what we imagine research to be. Despite the difficulty in the broad research context and in building rapport and openness with participants given that context, the surprise intersubjective openness from participants, the lived experiences women shared with me, wedding invitations received from participants, WhatsApp messages I still receive and other indicators, have made me believe that it is still possible to engage deeply and meaningfully in this research context, a product of walking softly even when conducting research amongst constraint.

Gendered Dimensions to Method and Practice

"Women do not have the strength to work underground," or "women could never do that work!" where sentences I often heard during fieldwork. Throughout this study, women were blocked from various mine tasks or positions, largely based on gendered ideologies and at the hands of male gatekeepers, whether colleagues, managers or authorities. Similarly, as a female researcher I was often told by male authorities, "the research location is unconducive for a woman" or "it's too dangerous for a woman!" This study focuses on women, was conducted by a female researcher and applies a feminist epistemology, all of which contribute to centring women's experiences. These factors privilege a female perspective on extractivism in Africa's Great Lakes region and are framed by my positionality and gaze as a female researcher and my previous findings about gendered dynamics in the sector. In addition, gender, I argue, had tangible implications on this study, notably through subjugation to persistent male gatekeeping and a generalised paternalism towards women, a form of everyday violence. This presented both opportunities and barriers, reflecting tensions and frictions that are constantly in dialogue throughout this dissertation.

Male gatekeeping permeates this study. The vast majority of persons in positions of authority, from mine managers and owners to state officials and police, were men. Even in Rwanda where gender equality is highly promoted, positions of leadership in this study

were primary held by men. For female participants, male gatekeepers had the ability to block them from certain mine positions and create separate gendered spaces. They had the ability to intimidate, harass and abuse women and to decide if women were capable of certain mine tasks. Women who work in extractivism, a highly male dominated sector are made "other," placed outside (literally and figuratively) mines and mine work by male gatekeeping.

As a female researcher, male gatekeepers also had the ability to (and did) block my access to fieldsites, demand my time in inappropriate ways, make inappropriate requests and determine if I was capable of research in certain settings or not. My access to mine sites in eastern DRC was significantly delayed and very difficult to negotiate with local authorities, bifurcated between my positionality as a woman and white foreigner. My gender directly impacted access for example, when a mine company general manager in Goma said, "the research location is unconducive for a woman." Here he clearly asserted my gender as an inhibiting factor to fieldsite access. While the security situation in early 2022 was shifting and required careful monitoring, I regularly received conflicting information about how "safe" or "unsafe" it was. How much of the "safety narrative" was true and how much was a reflection of an asserted gendered protectionism by male gatekeepers was unclear. I was able to negotiate this through significant consultation with trusted local contacts, both male and female, at the national and local levels, and through local women and men negotiating access on my behalf, largely due to their knowledge of local procedures and appropriate steps for access.

While the gendered aspects of this project closed doors and, at times made things more difficult, the fact that I was studying women also presented opportunities in field access. A generalised paternalism towards women – and as such this research topic – opened many doors for me. "Oh yes, those poor women who work in the mines need your help!" was a common attitude expressed by male gatekeepers during fieldwork, granting me access to work with and interview women, and opportunities to meet women and visit sites not originally planned for. The view (as problematic as it is) that women are still in need of "saving" or "outside intervention," facilitated this research in many ways (Abu-Lughod 2002). Male gatekeepers, for example state authorities, who held this view were

supportive of the overall ambition of the research and this would facilitate my access to fieldsites and women themselves. Male gatekeepers were often eager to show me, the white foreign female researcher, how advanced their technology was at the mine site or how many women worked for them. This reiterates that valuable research is possible in environments of constraint, whether that constraint be due to conflict, gender or other considerations.

Given this context, I return to a question posed by feminist anthropologists on what effect feminism and female researcher/participant experiences could make on conducting anthropological research (Abu-Lughod 1990a)? If we adopt a feminist perspective that there can never be purely "objective" research and rather the positionality of the researcher greatly impacts the outcome of the study, gender informs all aspects of this study, from my own positionality as a researcher to that of research participants. As Lila Abu-Lughod reminds us, there is no single female experience or voice of "women," rather like all studies, this one is situated and partial in representation and knowledge production (1990a). However, despite conditions of constraint, this study contributes to voice and making visible.

Conclusion

This study examines "the everyday" lives of women and the methods used to do so are equally rooted in the everyday. The everyday context of this study is one of "everyday violence," meaning the mundane, invisible, visible and subtle violences of everyday life that collectively create a "state of terror" (Taussig 1992, 17), in which people live and try to survive. Some women are better able to navigate these, or are more protected from them, than others, as I will show in this dissertation. Nevertheless, these violences have tangible impacts on participants' worldviews and actions. Thus, in trying to understand "the everyday" experience of women working in extractivism in Central Africa, the research environment cannot be removed or detached from those experiences. Everyday violences manifest through fear, a product of regional conflict and histories of conflict

that are linked to current government practices and regional geopolitics. This fear has created a context of mistrust and silencing for both myself and research participants.

I experienced a significant amount of anxiety and paranoia throughout my fieldwork, affecting how data was collected and with whom. For example, after an interview with a very reserved and closed participant, despite their voluntary consent to participate, I wondered: could they actually be a spy for the state that wants to know what kind of questions I'm asking? Even at the time of writing, I can find no certainty if I was being "too paranoid" or accurate in my assessments of ethnographic encounters. This is exactly the kind of everyday violences experienced and presented with in trying to understand "the nervous system" (Taussig 1992) (here I am thinking with my own nervous system and the nervous system of the state), where we "…stand in an atmosphere whipping back and forth between clarity and opacity, seeing both ways at once" (Taussig 1992, 17). This manifestation of everyday violence within my own life is a reflection of the broader research environment, and it had visceral effects on me.

Despite this context of everyday violence through fear and silencing, research in environments of constraint should not be deterred. The broader context informs the study but does not delegitimise it. The context of violence and conflict provides a line of inquiry into the lived realties of participants and researchers living and working in this kind of environment. By making visible the context, we can better understand women's silences, women's hesitations to participate, and women's choices in work. From the perspective of the researcher, making visible the context allowed for the shifting of methods and practice in order to better understand and exist within "everyday violences," not separate from them. This forms the foundation of this research.

In order to generate reliable and robust research in this context, I advocate for three primary strategies, including to "walk softly" (Sluka 1995), a high degree of flexibility in research design and through working closely with trusted local contacts. Walking softly includes reserving initial questioning and interviewing, promoting a reverse analytic gaze in fostering conversation and following the lead of participants as much as possible. It further includes taking time to become familiar with the research environment and

leaving the field when necessary. By applying flexibility in research design, both in terms of where and how research is conducted, research can continue and offer valuable insights despite constraint. Lastly, by working closely with and following the guidance of trusted local contacts, it is possible to safely and efficiently navigate difficult research environments, like this one.

These three key factors to successful research in environments of constraint were implemented in this study in multiple ways. By remaining flexible in research design, the fieldsites of this study changed. I researched less in DRC and more in Rwanda than originally anticipated, including pivoting to Rwanda sooner than expected. By walking softly I was able to conduct interviews and work alongside women in ways that were appropriate and unintimidating, contributing to enhanced trust and intersubjective openness. Women largely guided the interview process, which helped keep them safe. By following their lead, in-depth interviews took place in places and ways that women preferred, facilitating in-depth data collection despite a culture of silencing. Participants shared powerful life histories and personal information that was, at times, on sensitive topics, a reflection of the possibilities of research in contexts of "everyday violence." I followed the lead of NGO contacts in where to conduct research and in ways that were acceptable given the regional and local contexts. This contributed to some of the fieldsites changing in this study, as I trusted their judgement in reference to which places were safe and how best I could interview and work alongside women.

The overall research environment sat in tension between silencing and moments of intersubjective openness. I experienced many incidents in both DRC and Rwanda where women approached me in seeking and requesting to participate in this study. My efforts to remain transparent also facilitated moments where participants spontaneously shared their opinions, perspectives and experiences with surprising openness. This chapter made visible the tensions that exist within the realities of conducting research under constraint and how I responded to them. As the following chapters will show, women's experiences of marginalisation sit in tension with a strong rejection of victimisation and distinct efforts to reclaim space and place in mining. Tensions within

the everyday exist in both the methods and in the broader gendered experiences of everyday work explored in this dissertation.

CHAPTER THREE: (EN)GENDERING THE 3T MINERAL SUPPLY CHAIN

To engender is defined as to "give rise to" (Pearsall 2001, 472). By engendering the mineral supply chain in Central Africa, I mean to make visible, to give rise to, women's experiences working in extractivism along this chain. I also employ the term (en)gender as a double meaning; to both engender, to give rise to women's experiences, and to gender the supply chain by spotlighting women's experiences, to make the supply chain gendered. In seeking to (en)gender the mineral supply chain, this chapter will draw attention to women working all along the mineral supply chain including downstream production roles, and not only women working at mine sites, which has in academic literature to date received more attention. I will do this by profiling a sample of female workers along the entirety of the chain, which will begin to show not only what positions women occupy along the supply chain but also how they experience gender within the everyday. This is important in order to understand how gender impacts global systems of production and what extractive frontiers look like through a gendered lens.

By (en)gendering the supply chain, I further differentiate the various "nodes" of the supply chain, a term used to mean both the points of exchange in mineral production and to depict the various roles along the supply chain where I have identified women. As introduced in Chapter One, the 3T mineral supply chain consists of the extraction and transfer of minerals from mine sites to processing, to packaging, to transport and eventual export. This process involves multiple actors and people, from miners and traders to mine owners and subcontracted workers, all involved with the production of 3T's. The minerals change hands and locations multiple times from one step to the next when put in motion along the supply chain; this creates points of exchange, or what I term nodes. Nodes further depict the varying positions and labour tasks in 3T production where women are active. Some of these nodes have minor differences, while other times, nodes have large differences, with distinct working contexts and locations. For example, mineral extraction and processing work, nodes one and two on the supply chain, are similar working contexts for women, who conduct physically demanding work at mine sites in rural areas and earn low wages. However, further downstream at node five of the supply chain where women work at export houses, they conduct primarily administrative

work in urban centres and earn higher wages. The work these women do is different and occurs in different locations, as minerals move from mine sites through to export. Nevertheless, women do work at each of the supply chain nodes, including mine sites, mine ownership, export houses and in export. As described in the Introduction Chapter, I employ a broad definition of extractivism to include mine work *and* downstream production roles. Although not all downstream production roles are involved with direct mineral extraction (i.e. the physical extraction of mineral substances), each node is vital to the functioning of the broader mineral supply chain and cumulatively put minerals in motion, which in its entirety makes up extractive frontiers. I describe the supply chain and extractive processes in more detail in the next section of this chapter.

This chapter answers the sub-questions: What roles do women occupy along the 3T mineral supply chain? What are the nodes of the supply chain under analysis in this dissertation? How is the supply chain gendered? How do women experience gender within their work along the supply chain?

This chapter argues that by (en)gendering the mineral supply chain women's participation decreases along the chain as economic opportunities increase. It further argues that the supply chain is not linear but complicated, with minerals moving not in one single one-way direction from extraction to export, but in tangled steps of production. This is largely due to a blending of living spaces with extractive sites, which contributes to creative tactics of work and opportunities for women. These tactics begin to reveal women's "ways of operating" (Certeau 1988) within the everyday, explored through an analysis of how women tailor extractive work to their needs, conducting mine work from their homes. Lastly, I argue that extractive temporalities are experienced differently based on gender. I show this through a description and analysis of daily rhythms of work and how these rhythms are gendered.

Beginning with a detailed description of extractive process and the nodes of the supply chain under analysis, I will then provide a profile of female workers at each of these nodes. At the mines I profile three women to illustrate the varying roles women occupy when conducting the physical extraction and processing of minerals. I will then profile

one woman at each of the downstream production nodes, looking at mine owners, subcontracted company owners, female founded cooperatives, women in mineral transport, women at the export house and finally women along the export route. In drawing out the supply chain and women's various roles, I also track women's incomes across the varying tasks. With that overview of women's work contexts, I turn to an analysis of extractive frontiers as blended spaces of work, living and farming. I then focus on two women in eastern DRC who conduct mine work from their homes, in analysing how the supply chain is not linear but tangled. Lastly, I describe the daily rhythms of mine work in order to better understand women's everyday working context and how this differs from men's contexts. Cumulatively, these dynamics and the experiences of women explored in the chapter show how the supply chain is gendered and how women experience gender working along it.

Extractive Processes and the 3T Mineral Supply Chain

In order to better understand the work and roles of women along the 3T mineral supply, I would like to revisit in more detail the mineral excavation and processing steps as well as downstream production work, introduced in Chapter One. 3T minerals are first excavated from underground mining tunnels. In DRC and Rwanda artisanal extraction occurs without machinery through hand extractive techniques for excavation (using pestle and mortar) and subsequent removal of minerals from tunnels transported in bags. In Rwanda mines also use small-scale semi-mechanised mining techniques, which, in addition to hand extractive techniques, includes the use of small machinery such as jackhammers, bobcats and locomotives. Mine tunnels are located in open air mining sites, within concessions owned by mining companies. In DRC mining tunnels are dug by hand, rarely include reinforcing beams (wood used to support the tunnel structure from collapsing) and usually are too narrow and small for a miner to stand upright. Rwandan underground mining tunnels use reinforcing beams and are large enough for a miner to walk upright. Underground tunnels have multiple "dives," a term used to describe small offshoots from the main tunnels where miners dig or use jack hammers to acquire

production. In DRC mine sites are referred to locally using the French words *carrière,* to mean "mine site" or *chantier*, to mean "work site" or simply "site." Minerals are transported from underground to aboveground most frequently though the formation of a human-chain, where miner pass bags of minerals (around 25kg per bag) through a human-chain to reach the surface. In some mines in Rwanda, when tunnels are large enough, they use wheelbarrows or bobcats to transport minerals out. Once minerals reach the surface, they are refined by hand using wet and dry separation techniques. Wet separation uses basins, pans, magnets and sleuthing stations (shovelling, as depicted in Image One, Chapter One) to separate 3T's from waste matter, such as quartz and other stones. Dry separation includes the crushing and refining of minerals without water using a magnet to separate waste, primarily iron. Initial mineral processing and refining requires multiple rounds of wet and dry separation. Unique to tungsten mining, wet separation is conducted using separation pools, which I describe in more detail in Chapter Five. Wet and dry separation are depicted in Images Four and Five below.

Women in this study primarily work with excavated matter that is locally referend to in DRC as *mchanga* in Kiswahili, or in Rwanda as *umuchanga* in Kinyarwanda. In DRC *mchanga* was translated to French as "*les déchets*," meaning waste or garbage. In Rwanda *umuchanga* was translated to English as "sand." This matter is not pure waste or sand, meaning of no value at all, but is excavated matter of a lower quality with a higher proportion of waste material (such as quartz) compared to high value excavated matter, which is usually in larger pieces and not of the consistency of sand. High value excavated minerals are usually reserved for diggers (who are primarily men). In Rwanda higher value production excavated from mine tunnels are referred to as "nuggets." In DRC minerals are excavated from mine tunnels by *creuseurs*, the French word meaning diggers, and then traded by *négociants*, the French word for traders. Recall from the introduction that in DRC these positions are legally distinct and require different permits. In DRC women mostly buy *mchanga* from male diggers, refining it to separate 3T's which they can sell. Women often transport bags of *mchanga* they have purchased to their homes to conduct refinement processes. As such refinement occurs at mine sites and at women's homes. In Rwanda women do not use their own money to purchase minerals as they are employed as subcontracted labourers or directly for a mining company and are paid daily

by production in teams. As such, women in Rwanda do not transport minerals home. However, the excavation and processing work is the same. Throughout this dissertation I define *mchanga* and *umuchanga* as waste minerals because of their low quality and concentration.

Once minerals are refined and have reached a sand-like quality, they are bagged (traceability starts here) and transported to export houses. Export houses are locally referred to in Rwanda and DRC using the French word, *comptoir*. There, minerals are crushed and refined into a fine powder using small machinery like crushing machines and shaking tables.[17] Then, using an x-ray machine, the quality of minerals are tested and must reach a purity threshold for export.[18] Once certified as eligible for export (including purity test results and conflict-free traceability certification), minerals (now in a fine powder form) are packed into drums, sealed and loaded into overland transport trucks. Loads between 17-26 tonnes of minerals are then transported by road to East African shipping ports for export. Figure Three below shows the geography of the supply chain under analysis in this study from origin to export.

[17] In some cases, more frequently in DRC, minerals stop at trading centers operated by workers collectives and are further refined before reaching the export house.
[18] During my fieldwork this was reported to me as not less than 20% for tantalum and not less than 60% for tin.

Figure 3: 3T Mineral export route by road.

(By Thomas Slingsby, UCT Libraries)

Images Four to Eight below show the extractive process and some of the steps of production described here. Following the next section in this chapter, which describes these nodes through the narrative of participants, I provide a table that summarises the supply chain nodes in this study.

Image 4: A miner conducts wet separation.

Image 5: A miner conducts dry separation.

Image 6: Minerals are bagged, tagged and awaiting further refinement.

Image 7: Packaged and processed minerals awaiting export from export house.

Image 8: Shipment of minerals being unloaded at shipping port.

The Supply Chain in Motion: Women's Positions and Working Contexts

With an overview of the extractive process and a bird's-eye view of the overall supply chain under analysis, I will now provide a profile of women working at each of the supply chain nodes to zoom in on the labour context at each node.

Mine Workers

Liliane is 30 years old and has been working in an artisanal coltan mine in eastern DRC for ten years. She is the mother of six children and the first of her husband's three wives. He works as a *creuseur* (digger). Born and raised in the village beside the mine, she told me that she cannot read or write and none of her children are in school because she cannot afford it. She buys "a large bag" of *mchanga* (waste minerals) from men, paying anywhere between 30-50,000 CF ($15-25 USD), which she refines and resells for profit.[19] She works with small mineral stockpiles of anywhere between 1-6kgs after the refinement process, placing her amongst miners who work with the smallest quantities and smallest profits. Most women working in this context can earn $2.50 USD of profit per kg of coltan sold, meaning her average earnings per bag of *mchanga* would be in the range of $15 USD if she got 6kgs of high value coltan after refinement. However, she can never be sure of the quality of the *mchanga* she buys, sometimes getting more than six kilograms, other times no concentrate at all. In other words, she works in a highly unpredictable context, where she has the chance of making a higher earning than what she bought the *mchanga* for, of breaking even or possibly getting no profits at all. She does not have a digging or trading permit.

Dana is a 30-year-old Rwandan and has worked at the coltan and tin mine for three years. She lives a mere 15-minute walk from the mine site with her mother and two sons, in the village where both she and her mother were born and raised and where the mine has operated since the colonial era. She is separated from her husband. When I first met Dana, she was formally employed by a subcontracted company. This means she did not get a set monthly salary from the mining company but rather was paid based on

[19] All currency conversion is based on exchange rates in 2024.

production every two weeks from the subcontracted company. She reported her earnings as on average as 20,000 RWF ($15 USD) per 15 days or 40,000 RWF ($30 USD) per month. She reported her lowest 15-day payment as 15,000 RWF ($12 USD) and the highest at 28,000 RWF ($22 USD). She emphasised low wages as one of the biggest challenges she faces, with her lowest earnings just below $1 USD per day (1000 RWF per day). Her job is primarily in underground mining tunnels, working in the human-chain lifting bags of minerals out of the tunnels.

One day I arrived at the mine camp to find a group of 33 people sitting on the grass near the main entrance in a meeting, Dana and two other women amongst them. When the meeting finished, she approached me and explained that they were all miners who had been hired by the mining company and would no longer work as subcontracted workers. Dana was thrilled, stating that "I am happy now to be working for [the company] because I will be able to do other work in the tunnel, not just work in the chain and I will make more money. Now I can plan how much I will spend at the market and on other expenses, not like with subcontractors where you never know each month exactly how much you will make." She later told me her new monthly salary would be 50,000 RWF ($40 USD).

Josephine frequently led the prayer before the shift started, one of two woman I ever saw do this. She would pray in Kinyarwanda, eyes closed but in a loud voice, for 150-200 employees, everyone standing outside near the mine tunnel entrance. Josephine worked as a "team leader" for a subcontracted company at the mine. She is responsible for a team of 68 miners, Dana amongst them. In this position she is responsible for directing the group of workers, checking in on operations, recording daily production, recording worker attendance, calculating workers' wages, attending meetings and liaising with the company staff. This means she splits her time between doing the physical labour underground, working the human-chain lifting bags of minerals out of the tunnels, and time at the mine camp conducting administration and managerial tasks. Josephine is 34 years old and has been a team leader for one of the three years she has worked at the mine. She started as a subcontracted day labourer like everyone else but moved up to this position of leadership, a position that garners slightly higher wages. As a team leader she earns a monthly bonus from the subcontracted company, meaning a higher monthly

salary than other miners calculated based on production. Her monthly salary was in the range of 80,000 - 100,000 RWF ($65- $78USD).

She finished high school but told me "I didn't do well in school." She is married to a miner, and they have four children. Josephine lives a twenty-minute walk from the mine site and was born and raised in the village. "No one taught me this work. I just came and started pushing the wheelbarrow and doing the work. People mocked me because I'm very tall and skinny. They would say 'will you be able to do this hard mine work? You're too skinny! You don't have the strength!' But I just kept working."

Mine Owners

Camille owns a mine with her husband, which they have co-owned for two years. Until 2021 Camille worked for the Rwanda Mines, Petroleum and Gas Board (RMB) as a field officer, responsible for traceability and the inspection of mine sites. During that time, they found mineral deposits on their 2.5 hectares of farmland which she described as "a banana plantation" where they still grow bananas to sell and consume within the family. They earn 40,000 RWF ($30 USD) per month from banana sales, including both local varieties of banana fruit and cooking bananas. They also have four cows on the property. They discovered minerals there when they found "illegal miners" who had started mining artisanally on their property. They never conducted geological surveys but "just started extracting minerals" when they saw the artisanal miners there. She and her husband began the process together of formal registration and licensing of the company with the state, a process she described as, "very intensive!" In entirety it cost them 15 million RWF ($11,800 USD) involving two environmental assessment fees and multiple government registration fees. They used personal savings and her salary to cover these expenses.

Their mine consists of three tunnels that are each about 800 meters deep. They extract tin and hope to start extracting coltan soon. She said production has significantly dropped in recent times to 15kgs per day but used to be as high as 2-2.5 tonnes per day (2000-2500kgs).[20] She employs 20 diggers, including five women. She does not have

[20] This was the amount stated by the respondent but seems exceptionally high.

written contracts with them and they are paid through the commonly used cellphone banking system in the country, known as MoMo (mobile money)[21], or in cash. She also employs security guards who are on a fixed monthly salary. She reported her monthly profits after tax as 3 million RWF ($2360 USD).[22]

Camille is 50 years old and has a bachelor's degree in business administration from the Adventist University in Kigali. She and her husband have four children, two of which they financially support to attend university in Rwanda. Born in a rural village, she moved to Kigali in 1995 when she was 22 years old. She is the only member of her family to work in mining and has no relatives who previously worked in mining. Her employment by the ministry of mines which eventually led her to mine ownership "was an accident." She described the process as follows:

> *"The traceability system for minerals in Rwanda is very labour intensive. The government had to do a training to teach unemployed people how to manage and use it. I was one of those people. I got a job with them after."*

She explained to me that she had no prior experience in mine work, no industry knowledge or even specific interest in the mining industry. It was an economic opportunity, and she was invited to the training by a friend.

Subcontracted Company Owners

Sylvie, a 44-year-old woman, has been the owner of a subcontracted company for ten years with her husband. They have the right to mine on a specific part of a mineral concession owned by a friend. They do not have a formal written contract but rather a verbal agreement and she pays him a percentage of the profits for her right to mine within his concession. She said, "we don't have much choice on how much [is paid to the

[21] Mobile banking (in Rwanda known as MoMo – Mobile Money) is extremely popular in East Africa and commonly used to pay for goods and services and to send money to people.

[22] This amount was reported by the respondent as "profits." However, additional business costs such as reinvestment back into her business could decrease this profit margin. These specifics are not known to me as they were not reported as costs by participants.

owner], he decides" and the amount changes in line with market value, so "when the sale price is high, we pay him more." His company is registered with the government.

Sylvie was born in Eastern Rwanda but moved to Kigali when she was 20 years old with her husband. They have four children, one of whom is attending university in Rwanda, another is attending university in Kenya, while the other two are finishing high school. She was forced to stop high school during the Genocide and in its immediate aftermath could not return to her studies because she had to take care of her younger siblings. She did however eventually go back to school, finishing her high school diploma. Now married for over 30 years, she and her husband were married during high school. They own a farm near the mine site where they cultivate many different vegetables, including maize, beans, cabbage, carrots, eggplant, onion and Irish potatoes and where they have 15 cows.

Prior to her work in mining, she worked at a bank for 15 years, first as a cleaner and then working her way up to a cashier role. Through her work at the bank, she befriended a man who was a client there. At one point "he disappeared for a while" and when he returned, he deposited a huge amount of money into his account at the bank. Curious, she asked him where he got the money. He replied that he had started a mining company. This sparked Sylvie's interest and she asked him to take her to his mine and show her the work. After visiting the mine, she expressed interest in the work, and they agreed that she could mine on two hectares of his mineral concession. As she put it, she "immediately started looking for workers." She had no prior experience in mining or knowledge of mine work, nor does she have any family members who worked or now work in mining. The company owner and friend put her in touch with his brother who "had experience in the field" and agreed to help her get started. At first, she worked both at the bank and at the mine but eventually "the salary at the bank was not good and it was too difficult to do both." She quit her job at the bank and started managing the mine operations full time.

In the beginning she would "invest money as I had it. 50,000 RWF ($40 USD) here and 100,000 RWF ($80 USD) there" to "buy equipment like shovels and picks and pay workers." Soon after getting involved in mine work she convinced her husband to also

come join in the business with her. “It was a joint family effort. My husband and I support each other.” She explained that she knew it would be better if they worked together because “if one of us can’t go to the mine, the other can” and they could “trust each other, especially to manage anyone who steals minerals.” She explained that his work in the business focuses more on transportation of minerals and that previously he worked as a taxi driver.

Now, between the two of them they manage the operations of the site and travel to the mine daily, managing two tunnels and one open pit mining area. They hire one local male supervisor who is based in the community near the mine and is paid a monthly salary of 80,000 RWF ($65 USD). They have a formal written contract with him. They also employ 30-50 labourers, depending on the season, of which 5-6 are women, all of whom live in the surrounding community. They have verbal contracts with these workers who are paid cash on a rolling basis (meaning ad hoc, not a specified date). Sylvie explained that most of the casual workers do not have cell phones and so they pay workers in cash rather than through mobile banking. Their production is relatively low, which she reported as 15-20kgs of coltan per week and 50kgs of tin per week, making monthly production around 60-80kgs of coltan and 200kgs of tin. Their production is affected by the seasons and output is higher during the rainy season when they have better access to water for mineral separation and processing. She also highlighted that they have trouble finding workers during the peak farming season, as many day labourers “go work their fields.” She reported that her monthly profits are 1-1.5 million RWF ($785-$1185 USD) depending on production but assured me it was never less than 1 million RWF ($785 USD). She has no other businesses, although she had tried to run a bar but found it unlucrative and too difficult to manage.

Since beginning their mine operation, they have also bought two hectares of land nearby in hopes of expanding mine operations in the area. She was confident that the area is rich in minerals and that they will find minerals there because “many people in the community were mining there.” She exclaimed: “people could even be digging a toilet and find minerals there!”

Female Founded Cooperatives

Madelaine is the director and founder of a cooperative which functions like a subcontracted company but means the operations are managed by a small group of people, not a single individual. Their executive team is six individuals, including her: four men and two women. Madelaine is 61 years old and started the cooperative two years ago. She explained that there is an "owner" of a large mineral concession, of which they hold the extractive rights to mine within four hectares of his concession. They paid the owner a once-off payment of 100,000 RWF ($80 USD) for their right to mine there and continue to pay him 20% of all proceeds. Their cooperative is registered with state mining authorities and the licensing cost about 3 million RWF ($2356 USD), which took a one-year period to process. The concession owner is also registered with state mining authorities.

Madelaine was born in Rwanda but fled to Burundi with her family during the Rwandan Genocide. She was raised in Burundi where she completed an undergraduate degree in psychology. Her fiancé was "massacred during the Genocide," and she never wanted to marry after that stating, "he is always with me." She has adopted three children whom she supports financially. The eldest studies at university in Kigali. She returned to Rwanda in 1995 post-genocide to her home village, to the area where she now mines. Previously, during the colonial period, a Belgian company had mined in that area. After Rwandan Independence in 1962, the mining concession changed ownership between various private mining companies with intermittent periods without formal ownership or activity. During those periods, community members would conduct artisanal mining in the concession. Her father was amongst these individuals, working as a miner and in supervising other miners. As a child she would watch him work and even help him mine from time-to-time. She said "I used to see people transporting big stones. Then they found coltan." She described her father as "a great inspiration" in her idea to start the cooperative.

Soon after returning to Rwanda, she moved to Kigali and worked for 13 years for the tourism branch of the Rwanda Development Board (RDB). A few years ago, during a period of layoffs, she decided to leave the job and start the mining cooperative. Her uncle

also works in the mines in her home village and assisted her in finding workers when she first started the cooperative. She interviewed and chose the five other executive members based on their experience and industry knowledge. All live in the surrounding community and were recommended by her uncle. In order to have the financial capital necessary to start the cooperative, she sold some of her household goods, like her TV and radio.

Depending on the season, the cooperative hires 100-200 labourers who are paid in cash based on production each day and are provided with lunch. “They [diggers] can’t go a day without cash!” Madelaine told me. Miners work in teams of 10-20 people with either a team leader or captain. Team leaders get a monthly salary of 100,000 RWF ($80 USD). There are ten women who work amongst this labour force and two team leaders are women. Madelaine reported production as 20kgs of coltan per day and 40kgs of tin per day, making monthly production around 120kgs of coltan and 240kgs of tin.[23] She said they also have lithium and Beryl (a gemstone) within their concession and added that “the more you mine the more you discover! Including new minerals like lithium.” Production is significantly affected by the seasons but in contrast to what some other participants reported. Madelaine stated that production is higher during the dry season and their costs go way up during the rainy season because mining becomes more labour intensive as they must “hire more people to clean and get the water out of the tunnels.”

Madelaine’s official title is Director of the cooperative and she is responsible for management and supervision of operations. She goes to the mine at least once per week as well as oversees the mineral purchase process at export houses, where she meets individuals who transport minerals from the mine to Kigali. She reported her monthly salary as at least 100,000 RWF ($80 USD) and up to 1 million RWF ($784 USD) per month but added that “in the rainy season I can get nothing.” After paying the necessary percentage of profits to the mine owner and all operational costs, including wages for workers, the remaining profits are shared amongst the six executive members.

[23] The mine does not operate on a Sunday.

Mineral Transport

Danielle is 33 years old and employed by a mine owner to manage and coordinate mineral transport within Rwanda, largely in connection with her responsibilities in overseeing traceability due diligence for the mine. She travels twice a week from Kigali to the mine to tag minerals and once a week she accompanies the truck of 8-10 tonnes from the mine to export houses in Kigali, a maximum distance of 95kms. They mine tin, tungsten and tantalum.

Danielle has worked in the mining sector for ten years, two years at an export house and eight years for this mining company. She was first introduced to mine work through her older sister who works at an export house in Kigali, and who she said "inspired me to enter mine work." Now, they both work for the same mining company. Her sister is responsible for managing mineral sampling and testing in the lab. Although her sister inspired her, it was through a friend that Danielle gained the necessary skills to enter extractivist work. A friend invited her to a training conducted by South Africans on how to use mineral purity testing equipment and conduct mineral analysis. Following the training she was offered employment at an export house in the lab. A family friend, who was a mine owner and sold minerals at the export house where she worked, eventually hired her, impressed by her expertise in mineral analysis. Danielle's monthly salary is 400,000 RWF ($315 USD), with the occasional "allowance" of 10-15,000 RWF ($8-12 USD), primarily for communication (airtime and data). However, Danielle reported that sometimes her boss will decrease her monthly salary arbitrarily if the buying price of minerals is especially low.

Danielle was born and raised in Kigali and married with two sons, aged three and five years old. Her husband works as a driver in Kigali. She does not own a farm or have any other businesses. She works very closely with the mine owner and his son and between the three of them they manage all operations. She said, "I have a lot of trust from the boss, so I do a lot of different jobs." She said she oversees and manages mine safety, traceability, transport of minerals, processing and sampling at the export houses and general operations. Her responsibilities end with sale and payments of minerals. Her "boss" tells her which export house to sell to and he negotiates the sale price.

Danielle described her work as "challenging." She stated "it's not an easy work, that's why not many women do it. It's very demanding of energy, you sacrifice yourself for that work to be completed. You have to get up early and you get home late. Maybe there are only three women who own mines because it is difficult work! It is difficult to find the trust from mine owners. They don't trust women to work for them. It's not an easy work."

The Export House

Jessica is 26 years old and works at a small Rwandan-owned export house in Kigali. When I first met her at the export house, she said her job was to "take care of clients," meaning to greet them upon arrival and make sure their process of selling minerals went smoothly, involving a multitude of tasks. Later she said, "I do all tasks at the *comptoir!*" She receives and registers clients, keeps track of mineral stock, she assists with logistics and records production in logbooks. While conducting participant observation at the export house I saw that Jessica had very strong relationships with the clients who would come to sell minerals. She knew many of them by name and would laugh and joke with them. She was particularly friendly with the wife of a mine owner, who would often accompany her husband to the export house. They were both pregnant at the time, exchanging pregnancy stories. Although Jessica never worked directly in processing or refining minerals, work reserved for her male colleagues at the export house, she was on the shop floor recording the weight of incoming and processed mineral stocks and overseeing client relations.

Jessica has worked at export houses for five years. Many of her family members work in mining and she was first introduced to mine work through her sister who owned a small *comptoir* with her husband for ten years. After Jessica graduated from high school her sister offered her a job at her export house. There she did many jobs but mostly lab work in mineral sampling. Her sister had to close the export house because "the tax was too high! They couldn't pay the tax." Soon after, she was offered the job she has now, at the export house owned by her second cousin, whom she said is "like a brother." She told me he asked her to come work for him because he knew she had experience in mineral processing work. No formal documents or application process took place. Many of her

colleagues at the export house were family members, something she primarily attributed to trust. “Normally in mining it requires people you trust because people can steal. So, in mining you often find many family members working together.” The daughter of the export house owner oversaw the lab work, and his sister-in-law was one of three women on the shop floor working with Jessica. She said she had high job satisfaction, stating “I enjoy the work! I enjoy socialising with people and having fun with people. But I don’t like the dust. I preferred the lab work.” Her monthly salary is 150,000 RWF ($120 USD).

Jessica met her husband through her work at the export house. He is a driver who would bring minerals there to sell for his brother. Jessica gave birth while I was conducting fieldwork in Rwanda. When I met her newborn son at her house in Kigali, she told me she wanted him to be a mineral trader “because you can make a lot of money!”

The Export Route

Rachel owns and operates a restaurant at a truck stop in Tanzania along the mineral export route. There she offers traditional Swahili cuisine, like pilau, rice and beans, chicken, fish soup, mandazi (doughnuts), chapati (fried flat bread) and tea. Her restaurant is open from 5:30am to midnight and she hires four women who help her with the cooking and serving. She said she can have over 100 customers per day, mostly truck drivers, a number she calculates based on how much rice she sells daily. She moved to the town where the truck stop is four years ago and opened her restaurant three years ago. She said “I moved here and was selling cooking oil on the side of the road. I saw many drivers passing by and saw they did not eat well, and I felt sorry for them…so I thought ‘hey I can do this and open a restaurant for them!’” Rachel is 35 years old and a widow, who financially supports her four sons from this business. A Tanzanian, Rachel also spent time as a child in neighbouring Zambia and Malawi with her family because of her father’s work with international NGOs.

In addition to the restaurant, Rachel also sells gasoline to truck drivers, who frequently face gasoline shortfalls. Shipping trucks travel with enough fuel for a return trip when they leave their location of origin, which is calculated by the company based on projected fuel

consumption per kilometre. However, depending on the actual weight of the load, trucks can consume more fuel than is expected. If discrepancies arise between actual fuel consumed and projected fuel consumption, drivers are often accused of fuel theft. As a result, drivers frequently must use their own money to purchase fuel to arrive at their final destination as the company assumes theft and will refuse to buy additional fuel to make up for shortfalls. I saw this in person while I was accompanying a driver and shipment of minerals from Kigali to Dar es Salaam. The shortfall caused significant delays (one full day), stress to the driver and created general challenges, like long and frustrating phone calls with the head office management. Rachel expressed significant compassion towards the drivers, recognising how hard their work was, with long hours on the road and long periods of time away from their families, saying "it's very hard for them!" In addition to the restaurant business, Rachel saw the opportunity of additional income from fuel sales, due to the commonality of fuel shortages amongst drivers. Rachel saw an economic opportunity based on international shipping, living along a trade artery through Africa, and has created a thriving business.[24]

Each of the women profiled here shed light on the different types of work women conduct and the roles they occupy along the supply chain, revealing the nodes of the chain. Table One below provides a summary of the nodes and associated work based on these profiles.

[24] Rachel's income is unknown and that is why it is not included in this description.

Node 1: Extraction Location: Rwanda and DRC	• Includes mine workers at mine sites in rural areas. Primarily underground mine work • Incomes: $30-$100 • Salaried or paid by production • Legal and illegal workers • Concentration of female workforce: High
Node 2: Processing Location: Rwanda and DRC	• Includes mine workers at mine sites in rural areas. Primarily aboveground mine work • Also includes work conducted at sleuthing stations and individual homes • Incomes: $110-$500 • Salaried or paid by production • Legal and illegal workers • Concentration of female workforce: High
Node 3: Mine Management Location: Rwanda	• Includes mine owners (MO), subcontracted company owners (SCO) and female founded cooperatives (FFC) • Takes place at mine sites in rural areas and at export houses • Incomes: MO: $2300-$2500; SCO: $800-$1200; FFC: $80-$800 • Entrepreneurs: Paid by production • Legal workers • Concentration of female workforce: Low
Node 4: Mineral Transport Location: Rwanda and DRC	• Includes independent traders and employees of mining companies • Takes place from rural areas to Goma and Kigali • Incomes: $315 and up • Salaried in Rwanda. Based on production in DRC. • Legal workers • Concentration of female workforce: Low
Node 5: Export Houses Location: Rwanda and DRC	• Includes export house employees • Takes place in Goma and Kigali • Incomes: $120 and up • Salaried • Legal workers • Concentration of female workforce: Medium
Node 6: Export Route Location: Tanzania	• Includes business owners • Takes place in towns and villages along the export route by road • Incomes: unknown and varied. Not salaried. • Legal and illegal workers • Concentration of female workforce: Medium

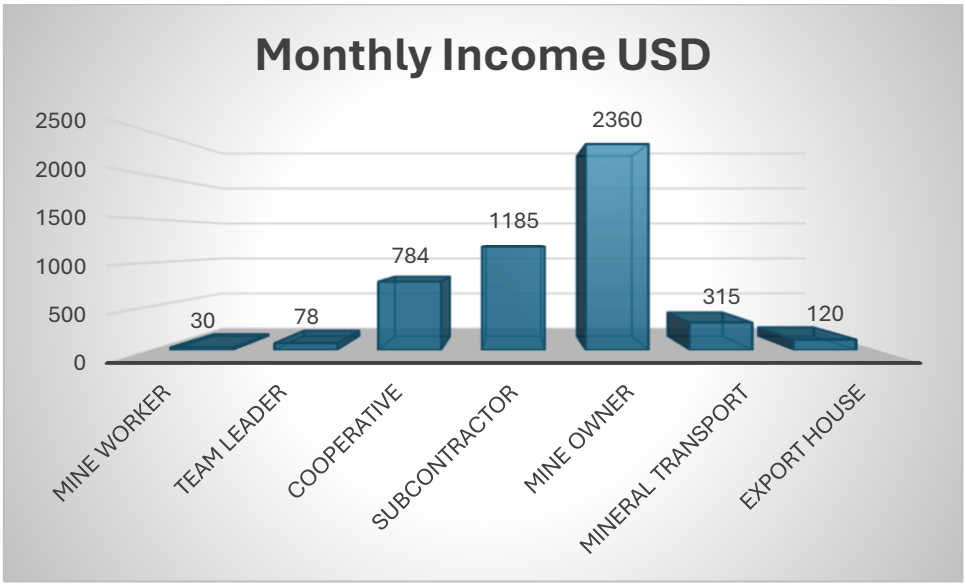
Table 1: Nodes of the supply chain and associated descriptions.

Nodes of the supply chain, as outlined in Table One, show the various points of mineral exchange and where women are active along the supply chain. While I distinguish the various roles women work in and the various nodes along the supply chain, at times

multiple roles occur at a single node. They are not separated because they occur in similar locations and with similar responsibilities, such as in the case of mine owners, women who own subcontracted companies and female founded collectives. In addition, I classify all work along the supply chain after nodes one and two (extraction and processing) as downstream production roles. This is because it is from that point that the labour context for women, locations and points of exchange change most significantly. They are also identified as roles that take place after mineral excavation.

Women's profiles also begin to tell us why and how women occupy these varying positions, something I discuss further in the next chapter. It shows us that women are often influenced to enter into extractive work by kinship networks. Also, it demonstrates that in high-income earning positions women often work in collaborative kinship structures. In all positions, women support their children and families through their work in extractivism, where in high-income earning positions, women can afford to send their children to university, including internationally. In downstream production roles women expressed high job satisfaction and took financial risk to enter the sector, often changing jobs and choosing extractivism with no prior experience. Although women in extractivism are most frequently positioned as victims, women's profiles begin to show alternative experiences from these dominant narratives. The histories of women at each node show that women's work in extractivism is a choice and an intentional livelihood strategy.

Moreover, we see a consistent increase in incomes in downstream production roles, analysing based on these profiles (which I have chosen as an average representation in the varying positions). Miners, those working directly in mineral extraction and processing, earn by far the lowest wages. All downstream production roles see higher incomes, although they varied from $300 USD per month to $2500 USD per month. Mine owners earn the highest profits when considering the entirety of the chain from extraction to export. However, income generation reaches a peak with mine owners and then decreases for women working at export houses and along the transport route. Mine owners are the greatest beneficiaries of extractive work, in monetary terms, when considering the entirely of the supply chain. Graph One below shows the shifts in women's incomes at the various nodes of the supply chain.



Graph 1: Women's monthly incomes in USD based on position along the 3T mineral supply chain.

Moreover, women's participation is most highly concentrated within mine sites. During the time of fieldwork, the company reported 575 of its 4901 employees as female, 11.7%, the majority of which worked in extraction and processing. The Rwanda Gender Strategy states that only 22 women are mine owners nationally, while 116 men own mines (Rwanda Mines 2022, 2), showing significantly more women working at mine sites in extraction and processing. As discussed in the introduction, academic literature has also reiterated a high concentration of female workers at mine sites in comparison to downstream positions (Paschal and Kauangal 2023). While women's participation in extractivism decreases from mines to downstream production roles, income earning potential increases, as the table and descriptions have shown.

The Same Soil: Blended Spaces of Living and Extracting

The supply chain described above exists in a blending of mine sites amongst villages and farmland in rural DRC and Rwanda, a foundational element to the landscape of contemporary mineral extraction in the region. There is rarely a separate physical barrier,

such as a fence or wall, between mines and communities. Around and amongst mine sites, one often finds cattle, goats and sheep grazing, as well as agricultural crops planted on family farm plots. The houses of residents are found within mining concessions where, as I noted in my previous research in DRC (Furniss 2021), mines can be found 500 meters outside a front door. In Rwanda, it was common while walking short distances between extractive tunnels and sleuthing (shovelling) stations that I would pass the family homes of residents (miners and non-miners), where they were often found cultivating potatoes or other vegetables from their small family farm plots. Local subsistence farming and mining coexist in the same spaces but not without tension.

In Rwanda, a company employee explained that the company leases the land from the government for a period of 25 years. The company has allowed residents "most in-need" to stay and farm, while others were compensated to relocate. [25] These farmers do not pay the mining company but are not permitted to plant "long-term crops, like bananas or casava." In instances where residents are not required to move but mining expansion infringes of existing agricultural land, residents are compensated. Other participants who own smaller mine companies also reported a similar model, including the relocation of residents to make way for mine activity. Some mine owners also had charitable programs for local residents, including the gifting of milk for local children in need and food programs for low-income families, again showing the proximity of extraction with the dwellings and lives of local residents. Mining scars are also found across the landscape, primarily abandoned artisanal mining shafts or pits. Many of these previous mining sites are now being used for agricultural purposes. As Image Nine below shows, the blending of these spaces and the environmental scars of artisanal mines are distinct and visible.

[25] The specific amount of compensation is not known.

Image 9: Blended spaces of living: Farm crops planted amongst mining scars.

Moving from mines to downstream production roles, nodes along the supply chain are equally blended within living spaces. Export houses are found in residential areas, near people's homes, markets, schools and community centres. While export houses are located in secure buildings, with a gate, fence and wall separating the facilities from the public, they are highly integrated into residential areas. Restaurants found along the export route, like that of Rachel's, are also often attached to individual houses or nearby dwellings within communities.

When situating the supply chain described here within the broader manufacturing of digital technologies, these blended spaces from the vantage point of the end-user are what Val Plumwood calls "shadow places." She describes these as "the many unrecognised, shadow places that provide our material and ecological support, most of which, in a global market, are likely to elude our knowledge and responsibility" (2008, 139). In the context described here, there is no separation between mining, farming and living quarters. The same soil that feeds residents through agriculture, is the same soil that feeds mining and mining companies. The soil that gives life through the growing of crops and food can also take life away, in this case through relocations or illness (which

will be discussed in Chapter Five). In downstream production roles, "making a living" and spaces of living are blended through close encounters and interconnections.

Tangled Relations of Production: When the Home is the Mine

The section above has described the work of women at the different nodes of the chain, from point of extraction to the export route, in a linear representation. Through this description the mineral moves neatly from one step of the chain to the next, with women's contributions and benefits varying. However, within these "shadow places" (Plumwood 2008), women have created work environments that allow them to thrive in unconventional ways. Each node of the chain is much more complex and does not always follow a neatly linear motion of production and trade in a unidimensional direction. Women often blend home spaces with mine work, in tension with local mining law but to women's benefit. Although there were instances of this in Rwanda, the blending of home and mine spaces was much more pronounced in the DRC, on which this section focuses. Furthermore, this section focuses on revenues, motivating factors and daily work rhythms, providing a general overview of women's lives in blended home and mine spaces. Chapters Five and Six discuss more deeply the reproductive, social and cultural aspects of women's everyday work context.

Pascale sat at her small wooden table in her two-room house situated about 500 meters from the *carrière* (mine site) in eastern DRC. We chatted as she conducted dry separation of coltan, using a metal pan and magnet to separate waste materials, mostly iron, which she piled on the table beside her. Her five-year-old son, whom she plans to start in school next year, moved around the room, intermittently sitting next to me on a wooden bench. Pascale is 27 years old and six months pregnant with her second child. She finished 6th primary and is married, her husband's only wife. Her husband used to work as a *négociant* (trader) but left the work because he was not earning enough. Now he works the small farm plot they rent harvesting vegetables, mostly potatoes, for family consumption. "I approached my husband to teach me how to mine" she told me. Pascale

works in buying, refining and reselling in the range of 100kgs of coltan in a month, all of which she does from her house. Most days when passing Pascale's house on the way to the mine site, I would find her drying coltan on a mat outside or conducting dry separation either inside or outside the house. She reported earning 50,000 CF per week ($25 USD), earning about 5000 CF ($2.50 USD) per 1kg of coltan she sells, making her monthly earnings about $100 USD. She mostly sells to a *négociant* named David, who lives in the nearby village of Ngungu and comes to her village to buy minerals twice per week. They have worked together for a few years now and know each other well. I met David at Pascale's house, the two of them refining coltan outside. He had come to buy coltan from her. David has a bachelor's degree in development studies but started working as a mineral trader because "the money is better and I wanted to work for myself." He does not buy minerals from high producing sites like those found in Rubaya but rather small *chantiers*, like this one, and he has a legal permit to conduct the work of a *négociant*. He trades in quantities of between 300kgs to 900kgs, buying from small producers and selling to the export house in the provincial capital city, Goma.

Pascale is from a nearby village 10kms away, where there are also artisanal mines, but moved to this village ten years ago when she married her husband, who is from there. She has worked in mining for six years and when I asked her why she chose mining she said "it's better to work in the mines. How else will I make a living?" She went on to say, *« c'est une grande entreprise qui soutient la vie quotidienne, »* translated as "[mining] is a big business that supports daily life." That afternoon while sitting with Pascale, a young woman of maybe 25 years old, came in the house and sold her some minerals, which she paid for in cash. Pascale told me she never goes to the *carrière* and does not have a mine permit.

This is how Pascale runs her business. From her living room, she buys minerals that other women who go to the mine site bring to her. She then refines these minerals either outside her front door or from her living room. She sells these minerals to a legal trader, like David, who comes to her house and with whom she has existing work relations. For Pascale, her house is the mine site. As the overview of mining law in DRC in the Introduction described, several aspects of Pascale's work are illegal: she mines without a permit,

processing minerals outside of designated mining zones and she is conducting mine work while pregnant.

Furthermore, within the legal binaries of mine work in DRC as either *creuseur* (digger) or *négociant* (trader), Pascale conducts trading work. She buys, refines and resells minerals. However, Pascale conducts this work on a very small scale, with very small quantities (only up to 100kgs) and outside formal channels (illegally). She does not engage in traceability tagging or formal sale of minerals at depots or export houses. She does the work of a *"petit négociant"* or a small trader, categorised as a trader with limited financial capital and as a result lower profits and less power (Furniss 2022; de Haan and Geenen 2016). Her business partner, David, is a legal trader who works in formal channels. Their relationship is convivial, friendly and based on mutual trust built over years of working together.

Women working as small traders is common, however few work as legal traders in large quantities of minerals, primarily because it requires much more upfront investment, which women often do not have. One of those women is Bernadette, who works with higher quantities but in a blended home and mine environment, similar to Pascale. Bernadette buys *mchanga* (waste minerals) at the mine site and takes them home to dry and refine. In the dry season she dries the matter outside her house but in the rainy season, she dries it inside over the fire. Using the example of tin, she said she can buy 1kg for 20,000 CF ($10 USD) and sell it for 25,000 CF ($12.50 USD) making her profits of $2.50 USD per kg. Bernadette is 32 years old and works in refining all 3T minerals found at artisanal sites near Ngungu in eastern DRC. Bernadette's husband, a *creuseur,* inspired her to want to start mine work and she has now been working in mining for nine years. She is the second of her husband's three wives and they have four children. She did not know how many other children her husband had, but she guessed around 15.

There are no standard measures such as scales at the mine site. Bernadette demonstrated how she measured using a large coffee mug as the marker for the amount that she buys, always trying to overfill the cup so she can garner a little extra profit. When conditions are good (like during the dry season when there is a lot of sun to dry minerals

faster) she can get about 10-15 000 CF ($5-7.50 USD) profit in one day but in bad conditions it might take four days to garner the same profit. In total she can work in the range of 100-200kgs of minerals. Based on the total quantity of minerals she works with and her profit margins, she could earn between $250-$500 USD per month, or for every cycle of 100-200kgs of minerals sold. The difference between her and Pascale is that Bernadette does not buy minerals from her house but rather goes to the mine herself to buy minerals and then refines them in the same way from her house.

Bernadette is the only woman I met who worked on a pre-finance system, a system of work common in Congolese artisanal mines. In this system, wealthy or high-income earning traders with significant capital give money to pit captains, who pay diggers to conduct extraction of minerals, which they then give back to traders, selling any extra production yielded.[26] Essentially, traders give a salary to diggers, who in return give them minerals after the fact. Very few women receive pre-financing because women do not conduct extractive labour (digging) and are rarely pit captains. It is also rare to find women who have the capital to pre-finance diggers, however there are instances of affluent women who do pre-finance male *creuseurs* (Furniss 2021, 70).

Bernadette is pre-financed by two male traders but works most closely with one of them. He is a well-known and well-established businessman who is from the village of Ngungu but now lives in the provincial capital Goma. “He saw that I was doing good work, and he approached me to start working for him,” she explained. She said he pre-finances three women, including her, who work in this way. If she gets good quality *mchanga,* gauged by the amount of production yielded, or if she can get a little extra production by overfilling the mug, she sells that production to him for a little extra money than what he gave her to begin with. She does not have a permit of any kind and they work under his permit, although she did report previously having a *Carte de Négociant* (trading permit) which recently expired and which she had not yet renewed. She reported the cost of this permit

[26] For more detailed description of how the pre-finance system works see Geenen 2011 and Geenen, Stoop, and Verpoorten 2021.

as $35 USD annually.[27] Bernadette shows us that women are beneficiaries of the pre-finance system but as traders, not as diggers in the physical extraction of minerals, as is commonly found with men. This reveals a gendered nuance, as the work is different but system of collaboration amongst miners the same.

Both of these women work in a context of blended sites of living and extracting as they work from home. In this context there is no distinction, no physical or metaphorical barrier between "the mine" and "the home." This begins to show the non-linear and blended forms extractivist work takes along the supply chain. In this case minerals do not follow a linear chain of production from the mine to the export house but go from the mine, to the community, through people's homes and eventually to export houses, in and through tangled networks and relationships. By working in this way women are also more protected and can maintain and balance childcare obligations. Despite some illegal aspects of how Pascal and Bernadette conduct work, such as not having a valid mine permit, they can continue to benefit from extractivism. It also protects women from potential abuse or exploitation within mine sites, which I explore in Chapter Five. Lastly, both Pascale and Bernadette work with medium sized stockpiles of minerals, earning much more than women mine workers that work in the mine site. The also do not conduct underground work but work in mineral processing, situated at node two of the supply chain.

Gendered Temporalities: Rhythms and Linkages Along the 3T Mineral Supply Chain

The everyday working context for women follows different rhythms based on the type of work they do and which country they are located in. This section explores these varying temporalities and rhythms of work based on these differing contexts, analysing the gendered dimensions collectively. This section is intended primarily as a descriptive section, descripting daily work rhythms and identifying how they are gendered. I start with

[27] Respondents' reports of the cost of this permit were inconsistent throughout the research period and some respondents reported a trading permit costing significantly more. Other academics have recorded that these permits cost $250 USD annually (Vogel 2022, 148).

a description of everyday work rhythms at mines in Rwanda, followed by mines in DRC. I then discuss the everyday work rhythms in downstream production roles including at export houses and in mineral export, including Rwanda and Tanzania. Due to the smaller sample size of women in downstream production roles, this section is not separated by task but rather described in a single section. Lastly, due to the more formal work environment in Rwanda, including things like set working hours and clear management structures, the description from Rwanda is the longest.

Rwandan Rhythms of Work

In Rwanda, there is a formal labour structure for miners who were employed directly by the company or who worked for a subcontracted company. The sites included three standard shifts of 8 hours; two shifts during the day from 06:30 to 14:30, 14:30 to 22:30 and a night shift from 22:30 to 06:30. Subcontracted workers were not permitted to work the night shifts but otherwise miners rotated between shifts. The mine operates six days a week and was closed on Sundays and for public holidays reported as Liberation Day (July 4th), Genocide Memorial Day (April 7th), Christmas Day (December 25th) and New Year's Day (January 1st). Office staff worked Monday to Friday 8am-5pm. Miners were expected to arrive 30 minutes before their shift started for pre-shift briefings guided by management. As highlighted in Chapter Two, because the company that provided the fieldsite for this study owned several different mine sites in different parts of the country, each site had subtle differences but followed the same overall labour structure. Some sites used locomotives and bobcats to move production out of the tunnels, while in others minerals were extracted only by hand. Some of the sites included a meal for miners before the start of each shift. This meal consisted of a cup of porridge combined with a doughnut and either a banana or hard-boiled egg. It was prepared by a local cook outsourced by the company. In some cases, the cost of this meal was deducted from the miners' salaries and in other cases covered by the company. However, at other mine sites meals were not provided by the company and miners brought their own lunches.

The pace of work for underground mine workers varied and a shift included moments of intensive physical exertion and moments of inactivity. At the mine site at which all

extraction was conducted by hand, the start of a shift was marked by a siren, at which point miners were expected to have finished their meal and to stand in an open-air area for the pre-shift briefing. Miners were required to scan QR codes to clock in and clock out of the shift; QR codes (on a laminated card attached to a lanyard) were provided by the mining company. The period before the start and end of a shift was always busy and bustling. Miners arriving to start a shift were often rushing to have their QR code scanned, so as not to be registered as late, while miners finishing a shift were quick to head home. All miners came to and from work on bikes or by foot from their homes in the surrounding communities. In some cases, distances between the homes of miners and the mine site were extremely far, with some miners walking 2-3 hours one way and a total of 4-6 hours to and from the mine. Each shift always started with a prayer led by a different employee. Team leaders had separate shift meetings with company managers immediately after the group briefings. Sometimes subcontracted team leaders would have meetings with their whole team to make announcements, after the larger group briefings. At one such meeting a male team leader scolded his team for coming to work in dirty clothes. “You must all do laundry on Thursday and come to work with clean clothes” he announced.

Miners always walked quickly and rushed to get to their underground workstation for the day. Subcontracted team leaders often shared frustrations with me when the pre-shift briefings went overtime and delayed the start of work, because this was seen as valuable time lost for potential mineral production. As they were paid by production, this negatively impacted their daily income. Because miners worked in teams, each team would go to a different underground location to create a human-chain formation to lift bags of minerals that had been extracted by the previous shift out of the tunnels and dives. Standing about one meter apart from one another, everyone took a position in the chain and lifted minerals out of the dives, including on ladders. Each bag weighed around 25 kgs. This was physically demanding work that occurred at a fast pace, creating high intensity moments of shift work. Workers then transported the bags in wheelbarrows to winch stations to be lifted closer to the surface and exit of the tunnel. Outside, workers again transported the heavy bags by wheelbarrows. When dives were closer to the surface or entrance of the tunnel, workers could transport minerals directly by wheelbarrow out of the tunnel, without using the winch. Once outside, miners refined

and separated minerals creating higher value production. Jack hammer operators worked in separate dives in smaller teams of 5-7 people.

All the different mine tasks had rhythms of fast exertion and high intensity followed by long waiting periods. While the work of the human-chain was exhausting work, it came in waves. We would lift bags for about an hour depending on production and usually wait at least 15-30 minutes before going to the next dive and starting the process over. Moments of low intensity and waiting periods were common and manifested in different ways. For example, I once witnessed two girls sitting in the tunnel just waiting, telling me someone had taken their wheelbarrow, and they were waiting for another one. In another instance I described waiting for jackhammer operators in my fieldnotes as:

> *There was A LOT of waiting around. At one point we stood for at least 20 minutes, the three of us and one jackhammer operator, waiting for mining assistants to come to help the operator. He could not start work alone.*
>
> Fieldnotes, 9 March 2023, Kigali.

Those thirty minutes were filled with gossip and chatter. Most frequently the chatter evolved around the daily pre-shift briefings. While I was conducting fieldwork, the company was in the process of announcing new company-wide policies on leave and disciplinary procedures among others. These were announced to all workers at these pre-shift meetings. On one occasion the company had discussed leave for marriage, which was granted for only two days and only in cases of civil marriage, not customary marriage.[28] For male miners, leave for the birth of child was only granted when the child was born to their legal wife, recognised through a civil marriage. The HR manager specified "you do not get leave for the birth of a child if it is from your mistress!" Later in the tunnel some men complained "how can leave only apply to a legal wife?" Their questions show a gap in how kinship is understood by the company, which placed emphasis on civil marriage and Western notions of the nuclear family, rather than localised norms of kinship, in how paternal leave is understood and implemented.

[28] Civil marriage is registered with the state and between a monogamous couple. Customary marriage follows traditional ceremonies and local practices between families. In Rwanda, customary marriage is not formally recognised by the state.

Sometimes the daily chatter evolved around my presence underground, with a miner once saying, “I wish I finished school so I could speak English or French and talk to the *muzungu*!” During these periods miners often asked me questions.

Etiquette for underground workers was universally known. Miners were free to exit any time they needed to use the toilet or take a break. Everyone was very serious about leaving the tunnels to use to the toilet, with a miner once explaining underground rules to me, stating with emphasis, “a miner can never pee inside the tunnel!” Managers frequently reminded miners that “you cannot drink alcohol at work or come to work drunk!” Sleeping on the job was not accepted but did occur. During fieldwork a video circulated on a company managers’ Whatsapp group of a male miner who had fallen asleep during a night shift on a pile of production, a little out of view from where everyone was working. A manager later told me, the miner would face a disciplinary hearing. In discussions with participants, miners frequently complained about the night shift, saying “it is very hard! You get so tired!” Sometimes miners intentionally tried to avoid work by hiding in the tunnels, knowing they would still be paid based on their team’s production, without having to contribute their labour. In one instance I witnessed, two team leaders told me they were searching for three of their team members, who they suspected had hid somewhere underground to avoid work.

Sleuthing work also involved periods of high intensity, mainly shovelling and washing minerals, accompanied by periods of waiting for more production. Sometimes during waiting periods, I would find miners napping. Sleuthing stations were sometimes completely empty during peak working hours. Some mine sites used blasting, which was always scheduled for 6pm, due to national noise restrictions in Rwanda. Since all explosives in the country are managed by the central government, there is an extensive administrative process to blasting and the military is involved in controlling and monitoring the allocation of explosives. In the late morning, I shadowed Roger, a company employee responsible for blasting. Before going to a special holding area, locked by the military, to pick up the explosives for the day, we chatted about the process. Roger explained to me that he has 25 blasters on his team and ten helpers. None of them are women. “I hope one day the company will send me a woman to work in blasting. I’m

waiting for them [women]." He said he recruits miners who are disciplined and have a high school education. Roger and I went by car with military personnel to pick up the explosives they needed that day. When I asked how many military personnel were present at the mine daily, Roger hesitated and replied, "Is that question really important?" I said it was not, and we quickly changed the subject. This short intervention was a subtle reminder of how difficult it can be to gauge which questions are considered sensitive in research; I had not realised it would be considered sensitive to ask about statistical data that could assist in understanding the broader "everyday" work environment. After picking up the supplies in a highly scrutinised process, we moved to a separate area where Roger and two members of his team mixed the blasting tubes. Only later in the evening would they place these blasting tubes in drilled blasting holes at the end of each tunnel and detonate them. Unlike other miners, the intensity of blasters' workdays came towards the end of the workday when most other miners were winding down.

Within these various tasks and their rhythms, gendered dimensions in the Rwandan context were varied. At some sites men and women worked in all tasks, in a gender mixed environment, including underground and in processing work. At other sites spaces and rhythms of work were distinctly gendered and separate. At sites where gendered separation in work was more pronounced, certain tasks were exclusively conducted by men, such as with the blasting team and in shovelling work. Some working groups were also separated by gender with groups of women in processing teams and separate groups of men. The reasons for these gendered divisions of labour will be discussed more in Chapter Six. However, the separation and mixing of gendered spaces meant that women experienced daily rhythms differently. The exclusion of women from underground work, shovelling work and blasting meant they worked primarily shifts during the day in waves of intensity. They did not conduct evening blasting work, and because fewer women were formally hired by the mining company, fewer women worked night shifts. In cases where managers searched for miners with higher levels of education, such as Roger, this also produced a point of exclusion for women, who in general have lower levels of education than men.

Congolese Rhythms of Work

The Congolese mining context, by contrast, is not one of set or standard shifts. There are no shifts at all, nor sirens that go off, nor company owners present. Miners work independently for themselves or in small groups, with their own capital. For this reason, there are no large influxes of workers at certain times in the day. Each day's rhythms are dependent on factors such as weather, if the site is yielding production, if there had been accidents, which authorities are in the area and if armed conflict is occurring at the site or nearby. The rhythms of Congolese artisanal mines shift quickly. By contrast to the more formally organised Rwandan mines, at times miners can be found sitting, waiting outside the tunnel, usually gossiping, sometimes napping or killing time by using a rock to crush minerals found around the tunnel entrance. This relaxed environment can change suddenly, notably when bags of *mchanga* are lifted out of the tunnel. Then, as I've described earlier, everyone forms a human-chain and assists in lifting the bags out of the tunnel at rapid speed. Since each miner works for themselves with their own minerals, some miners will leave immediately with their bags of minerals to take them home to refine or sell, while others stay to begin this process at the mine site. Once bags of minerals are out of the tunnel a water hose is turned on at the site for shovelling and sleuthing work, which is conducted in man-made trenches. Periods of shovelling are high speed and vibrant, with miners (30-50 people) working hard and speaking loudly to each other over the sounds of water and shovels. Within these rhythms, spaces are starkly gendered. Men exclusively work in the underground tunnels with women waiting at the tunnel entrance. When the water hoses are opened and sleuthing starts, men conduct the shovelling while women wait along the side. There are rare instances of women conducting shovelling work through special agreements with male miners, which I will discuss in Chapter Six.

Everyday Rhythms in Downstream Production Roles

Moving down the supply chain, rhythms became very intense and lively at export houses in Rwanda in the preparation, packing and lead up to mineral shipments. This is when a labour-intensive process occurs as minerals purchased from different mines are mixed together and packed into barrels for export. Some export houses would hire extra staff just for this step, as it requires a larger than usual labour force. At one export house in

Rwanda, workers joined in song and dance during the mixing phase. Bobcats are used to load barrels of minerals, each weighing about 800kgs, into an overland truck. Each barrel is painted with a number and in DRC the barrels are required to be painted in the colours of the Congolese flag. Despite the high energy during periods of export preparations, an average day at the export house was relatively uneventful, with a standard eight hour working day, mine owners coming and going sporadically to sell minerals, and processing occurring as needed. Minerals that arrived are unloaded from vehicles and undergo refinement, a loud and dusty process due to the crushing machines used. Administrators are involved in recording who brought what and calculating purchasing values based on purity test results and shifting global market values. Export houses provided lunches for all their staff and the working hours were standard business hours. Everyone took a lunch break between noon and 1pm to eat and most staff left by 5pm or just after. Mine owners who were selling processed minerals would often wait 2-5 hours for payment from the export house, sometimes having to return on a different day to receive payment.

The shipment of minerals overland followed the most repetitive daily routine. The driver would wake up between 4:30am and 5am, brush his teeth, call his wife and start driving at first light. Trucks with all kinds of goods from sugar to coltan parked in the same places and left during those early hours. Around 10am we would stop to eat a large meal. These breaks were filled with chatter and stories with other truck drivers and restaurant owners. Driving would continue straight through until dark. Once parked at truck stops for the night, we would walk into the nearby village, eat something and go to sleep. This routine was repeated for the four days it took the shipment to depart Kigali and arrive in Dar es Salaam. During this journey we passed other trucks that were broken down. The driver would always stop to assist and speak to the other driver about the breakdown. The comradery and solidarity between drivers was always strong and jovial, despite the fact they did not always know each other. The driver knew the best places to stop, some with showers or where you could buy spare truck parts, and he was always very proud to show me his favourite places to eat. Sometimes he would cross paths with friends, other drivers he knew. Border and customs crossings always took a half a day, involving long waiting periods of utter boredom. Shipment departure from export houses and arrival at the port were the busiest, with the loading and unloading of minerals.

The rhythms of the 3T mineral supply chain described here were always a combination of embodied experiences of intensity and inactivity. At mine sites I frequently saw miners napping and even in more regulated and corporate working contexts, miners found ways to sleep on the job. At other times, the work required exhausting physical exertion. Mine spaces were filled with comradery but also disputes and moments of tension when managers scolded or shouted at miners or where there were disagreements and disputes between miners. Mines were filled with gossip and laughter, although also silences. As you move from mine to processing points, export houses and overland export, rhythms largely stay the same with ups and downs in intensity.

These rhythms have gendered dimensions, in line with gendered contexts. As women's work is more concentrated in some areas and tasks than others, the rhythms of the mine are experienced differently. For example, women did not work in blasting and, depending on the mine site, did not generally work in shovelling (sleuthing). Women's presence at the port in Tanzania where minerals are exported was almost non-existent. At Congolese artisanal mines women would sit in groups outside the tunnel waiting for production as men conducted physically demanding digging work, marking a distinctly gendered dimension in mine site rhythms. While this is connected to the gendered divisions of labour, it also shows how even within a single workplace, the everyday work context and rhythms that put the supply chain in motion are gendered. These descriptions have also revealed tensions in assumptions and prevailing stereotypes about the working context at mines and in extractivist work. Rather than environments of overt abuse and exploitation, as is often imagined, the daily rhythms of work revealed harmonious, at times relaxed and convivial working contexts for women.

Conclusion

By (en)gendering the mineral supply chain, in making women visible, we see that women work at various nodes of the 3T mineral supply chain from mines to downstream production roles, from mine workers to mine management and along the export route. I

have identified six primary nodes of the supply chain (excavation, processing, mine management, mineral transport, export houses and the export route) where women are active, and which represent moments of exchange along the chain. By zooming in on the daily lived experiences of women who work in these various positions, we also see how the supply chain is gendered, notably through space, rhythms and economic opportunities.

On a macro level when considering the entirety of the supply chain, the highest concentration of female labourers is at the point of extraction and processing, nodes one and two of the supply chain. While women are present in downstream production roles, including high-income earning positions like that of mine ownership, the concentration of women's labour consistently decreases from node one and two onwards in downstream production roles. Income earning potential also changes along the chain. Mine workers make the lowest wages, sometimes only $30-$60 USD per month. There is some variation within incomes at mine sites, for example team leaders in Rwanda earn more ($80 USD per month). This is more pronounced in DRC where, as we saw with Pascale and Bernadette, they earned $100-$250 USD per month. However, there are fewer women working with higher profit margins at mine sites and their incomes are highly unpredictable. The majority of mine workers in this study worked in similar contexts and profit margins to Dana, around $30-$60 USD per month. We then see a gradual increase in income earning potential to above $300 USD for mineral transporters, between $1000 to $2500 USD for women who own mines or who have formed collectives or work as subcontracted company owners. A drop then occurs with women at export houses earning salaries just above $100 USD, more than most miners but less than the previous steps on the chain. This shows an inverse relationship between women's participation income earning potential, with women's participation decreasing as income earning potential increases.

The supply chain described here is not linear; rather the minerals travel in complicated and tangled networks, through multiple hands at mine sites, through communities, women's homes and within social relations of production. Using diagrams, scholars have mapped out the different actors in mineral extraction and the pathways minerals take in

early processing in eastern DRC. These demonstrate the complicated nature of extractive networks (Geenen et al. 2022). While traceability measures (as described in Chapter One) trace a liner supply chain of "conflict-free" mineral sourcing from mines to market, we have seen through "the everyday" that mineral production involves multiple hands and places of production that fall outside this linear imaginary. When women work from home, minerals move from legal mine sites to "illegal" home spaces and then back into "legal" trading and mineral tagging networks, surpassing neat and legal steps of exchange. This system of production has benefits for women, who find creative ways to make this tangled mineral production system work to their advantage.

The production of 3T minerals in Central Africa is deeply embedded in blended spaces of living, farming and extracting. Homes and farmlands surround mine sites and mines are part of the village landscape. This creates opportunity for miners and communities as it makes mine work highly accessible. However, it also sits in tension with communities, at times displacing residents. Most importantly, it is this blending of spaces (of living and extracting) that make the supply chain tangled. Pascale can work from home because the mine site is a 10-minute walk from her house and situated in a way that makes it easy for other women to bring production to her. The spaces also go through cycles of extraction (taking life) and replanting (giving life). As Image Nine showed, previous mine pits can once again become farmland, just as farms are taken away to make way for extractive sites. While for end-users these "shadow places" (Plumwood 2008) are out of sight and out of mind, for residents and women along these extractive frontiers they are part of the fabric of the everyday.

By introducing women's work in this chapter, some of women's "ways of operating" (Certeau 1988) have emerged. We saw that women find opportunities and creative tactics within sites of mineral production in order to benefit from extractivism. This was the case with Pascal and Bernadette, who used a tactic of working from home. This tactic protected them from vulnerabilities associated with their gender and their illegal status. It also permitted them to work within networks of trust that suited their needs. By employing tactics within the everyday, women demonstrated creative adaptations to make mining work for them. In another example, from downstream production roles,

Rachel (who sold petrol to truck drivers in addition to her restaurant business) seized the opportunity to economically benefit from petrol shortfalls, a consistent challenge facing truck drivers.

At each node of the supply chain the daily work rhythms for women are very different. Underground miners and those working in mineral processing go through waves of intensive physically demanding work juxtaposed with moments of inactivity. Some work standard shifts, while others work for themselves in their own time and rhythm. Mineral transporters work long days, and their daily work demands a significant amount of travel, including long hours away from the home, a complaint expressed by Danielle. Mine owners largely make their own schedules and often spend long periods of time in urban centres. Along the export route, women business owners servicing mineral transport combine long working days with flexibility in delegation of tasks to staff.

Rhythms at each node also have uniquely gendered dimensions. This is most pronounced at mine sites in relation to space, the types of rhythms women experience and the effect these have on the timing of their workday. Although gendered divisions of labour are discussed at length in later chapters, we have begun to see these divisions here and how they affect temporality in the mines. An example of this was in blasting work, conducted in a team without any women. Since that work was conducted in the evenings due to national noise restrictions, women did not work as late into the evenings as men, creating a different experience of daily mine site temporalities. This affects the types of hours and times of day women worked. In many cases women did not conduct sleuthing (shovelling) work, which meant they simply did not conduct this high intensity work but rather waited for men to finish this work in order to buy separated minerals from them. This also affects space at mine sites as gendered, with women separated from sleuthing stations, or excluded from underground mine tunnels. Although women did not report these temporalities as affecting their ability to balance childcare and home obligations, this finding provides insight into potential impacts on how women manage home and work responsibilities differently.

Lastly, the profiles of women at each node of the chain, including their reasons for entering the work, who they collaborate with and what benefits it brings to their lives, provides an alternative perspective to dominant narratives about women in extractivism. First, it shows that women are present all along the supply chain, despite generally assumed to be male dominated. Secondly, women's everyday work in extractivism reveals successful entrepreneurs and largely harmonious working environments. While certainly women face vulnerabilities and encounter challenges in their work in extractivism, we see how their choices to work in this sector are motivated for different reasons and do not produce a singular "victim" status. The gendered rhythms of work also show significant periods of inactivity, where I frequently saw women napping outside mine tunnels waiting for production. It is with this in mind that I now turn to a discussion of women's pathways into extractivism, the subject of the next chapter, in considering women's motivations and access to mine work.

CHAPTER FOUR: PATHWAYS INTO WORK IN EXTRACTIVISM

In an interview with a female miner in Rwanda she explained her reasons for working in mining as follows:

> *"After graduating from high school, I couldn't go to university because of lack of funding for that. So, I came to work here [in the mine] because it was close to where I live. At first there were not many women here. But I realised that if you [as a woman] have confidence to come, it is easy to get a job in mining."*

This chapter explores the factors that motivate women to work in mining and more broadly in extractive roles by asking what are women's pathways into extractivism? How are these pathways different based on the kinds of work women conduct? And which factors contribute to their success? By exploring women's pathways into extractivism, we can better understand why women work in the positions they do (and why not), the reasons for differing concentrations of women's labour at different nodes along the supply chain and, as a result, contributing factors to the gendered dimensions of the 3T mineral supply chain. This chapter argues that while women exhibit choice to work in the various extractivist tasks, the choice changes from economic necessity to economic opportunity as you follow women from mine sites to downstream production roles. It shows that while kinship is an influencing factor for women across the entire supply chain, it does not translate to economic opportunities for women mine workers as it does for women in downstream production roles. Lastly, I argue that while women in downstream production roles require and leverage social capital (Bourdieu 1986) in order to access extractivist work, for mine workers it is the opposite: they seek work in mining because of negative social capital (Wacquant 1998).

Pierre Bourdieu's pioneering work on social capital (1980, 1986) defines it as "made up of social obligations ("connections"), which is convertible, in certain conditions, into economic capital" (1986, 243). Bourdieu discusses certain foundational aspects of social capital including kinship relations, that it is "maintained and reinforced, in exchanges," and that it multiplies itself through these relationships (1986, 249). In

showing that capital stretches beyond economic terms, that capital is not only money or labour but involves social worlds and social contexts, Bourdieu calls attention to these social worlds, enacted or embodied through social capital, as a valuable point of analysis in understanding changes to circumstances and wealth. By understanding capital as accumulated wealth in both monetary and nonmonetary terms (whether human, cultural, physical or social), capital can be defined more broadly. Bourdieu argues that because social capital directly contributes to enhanced economic outcomes, it is a form of capital and can be understood as such (1986).

Building on this theory, Loïc Wacquant writes that social capital provides "a fairly good idea of how interpersonal ties affect life chances in some areas such as finding a job, raising capital to start a small business, hiring and retaining workers, [and] migration or gaining basic subsistence"(1998, 28). In his conceptualisation of "negative social capital" he argues that a void is created in the absence of social capital, making positive life chances more difficult, creating a disadvantage or "negative" when trying to get ahead in life through social relations. Both of these theoretical engagements emerge in the lives of women as explored in the sections that follow.

This chapter will examine the factors that motivate women to work in mining, meaning the physical extraction and processing of minerals at mine sites. As I will show, this includes factors like economic necessity, close geographic proximity between mines and homes, accessibility, formality, government intervention and intergenerational influences. While some women work in mining because they did not have the capital necessary to start their own businesses or to do the kind of work they preferred, other women turn to the mines when their businesses fail. Other women turn to mine work because they can earn more than in agricultural work. In addition, all respondents had little or no formal education, and many are illiterate, compounding the choice to work in the mines. Importantly, the majority of women who work in mines are not migrant labourers but are born and raised in the village or surrounding area to the mine, making mine work a choice based on accessibility. For women working in downstream production roles, we see some parallel motivating factors and some changes, with greater influences due to kinship networks, social capital and economic returns. In so

doing this chapter will also examine changes in motivations amongst women for their work in extractivism as you move from low-income earning positions in mines to high-income earning positions in downstream production roles. This chapter assists in (en)gendering the supply chain through the lens of what motivates, inhibits and enables women's participation at the various nodes of the supply chain, also signalling women's varying successes along the chain. Due to the many parallel experiences amongst women despite differing country contexts, this chapter is divided by theme, with indication of specific geographical location throughout.

Motivations for Work in Mining

Economic Necessity

The vast majority of women who work in artisanal mines are driven to mine work out of economic necessity, in the face of limited economic alternatives. In DRC and Rwanda, many women working directly in the physical extraction and processing of minerals earn very low wages. Dana, introduced in the previous chapter, earns in some cases less than $1 USD per day as a subcontracted worker in Rwanda. In DRC, while some women do trade with medium sized quantities (100-200kgs) and make a liveable wage of $8-$16 per day,[29] the majority of respondents work with very small quantities of 1-5kgs, earning as little as $1-2 USD per day. While all participants work in the mines to foster the most basic of incomes, there are multiple and differing factors that motivate this choice of labour.

Natalie is 30 years old and works with *mchanga* (waste minerals). She was born, raised and has never left the village in eastern DRC where we sit and where the mine site is. Natalie told me she works in mining because "I have nothing to do. I am here to make a living." She told me that, "I would rather work in commerce, selling casava flour and traditional fermented banana beer. But I don't have the money to start my own business." She works with small quantities of minerals saying, "it is rare to even get 1 kg of cassiterite

[29] This is calculated from the earnings female traders reported ($2.50 per kg) when selling mineral quantities in the range of 100-200kgs, gaining profits of $250-$500 per month or per cycle of 100-200kgs of minerals sold.

(tin) here per day" and reported her earnings as 2000-7000 CF ($1-3.50 USD) per day. Natalie also cooks and sells food (potatoes with corn and beans) to the male miners at the mine site.

Sarah, who is employed by a subcontracted company in Rwanda, attributed her decision to come work in the mine as purely financial. "I need the money. I don't like this job, it is very difficult…I get blisters on my hands and I get dizzy and have a lot of headaches. But I work here for the money." I interviewed Sarah in an underground mining tunnel, as she waited her turn to go up a ladder to a dive (a small offshoot) to collect minerals extracted with a jack hammer. Exhaust fumes from the bobcats used underground billowed around us, making me feel queasy and extremely unwell. Sarah concurred. Emily also works in the mine "for the money." She walks five hours every day to and from the mine (2.5 hours one-way), stating that there was no other work for her closer to home and transport costs to Kigali for work were too high. While accompanying her on this journey to her house she told me, "There is no other work for me. I work for [the company] for the money."

Some respondents turned to mine work when their businesses failed. Mireille is 65 years old and moved to the mining village in DRC a few years ago from Saké, 67kms away. Mireille lost five of her seven children all in the same year, stating "my children were poisoned by my in-laws because they did not like me." Due to the sudden death of so many of her children her husband divorced her and married her cousin. This tragedy motivated her to move to the village with her 14-year-old son. When she first moved to the village, she made and sold banana beer. However, she was unable to make a living selling it in the village and turned to the mine as an alternative. Although mine work was not her reason to move to the village, it became her livelihood. She works with waste minerals and has been working in the mine for one year. She reported her earnings as 2000 CF ($1 USD) per day. Mireille does not have a mine permit.

Similarly, Huguette turned to mine work when she could no longer continue with farming and commerce work in Masisi, DRC. She is 50 years old and explained her transition to mine work as follows, "I use to work on the farm and sell charcoal. But I started feeling very sick and could no longer transport charcoal. I needed other work." She did not

specify her illness and, out of respect, I did not ask. She is a widow with eight children, between the ages of 25 and 13, four of whom she supports financially. At the time of our meeting, she had worked in the mine for a few months and did not have a permit. She reported her profits as 5000-10,000 CF ($2.50-5 USD) per day but noted that there was significant unpredictability, stating, “Sometimes I can get nothing.” Both Mireille and Huguette started working in the mines because it was at hand and a convenient alternative for income generation. Neither of them had previous experience in mining nor family connections to the industry but learned on the job when they could no longer continue in the work that had sustained their previous lives.

Women are also motivated by higher profit margins in mine work in comparison to other industries, notably agricultural work. Laura is 22 years old and refines *mchanga* in DRC. She used to work in agriculture, harvesting crops for sale, but had come to work in the mine one year before we met because “the money is faster, and you make more.” She reported earning a maximum of 3000 CF ($1.50 USD) per day in agriculture, while in mining she can earn 10,000-12, 000 CF ($5-6 USD). She added that “even on a bad day I will make 5000-6000 CF ($2.50-3 USD) in the mine.” Similarly, a respondent in Rwanda who worked as a subcontracted worker described mine work as “very difficult” but compared it to agricultural work, the only economic alternative for her. “In farming you only make 800 RWF (¢60 USD) per day. What can I do with 800 RWF? I would rather work here and get 15,000 RWF ($12 USD) per day.” As Ofosu et al. (2020) have noted, rural residents often choose work in artisanal mining over agricultural work because profit margins are higher. Rural residents are also known to combine agricultural work with mine work for multiple reasons including working in the mines during non-harvesting periods or dry seasons, to supplement farming incomes, to generate income for farming expenses and due to structural adjustment programs that have made farming less economically viable (Hilson 2016; Banchirigah and Hilson 2010).

The examples given here show that while all of these women worked in mining out of economic necessity, they had different pathways. Some did so because their businesses failed or because they could earn more than in agricultural work, while for others it was

simply “for the money” from the onset. The mines also provided a livelihood in the face of family tensions and loss.

Accessibility

A respondent in DRC said *« je suis née et grandie dans les mines ! Ma vie est maintenant dans la carrière. »*; “I was born and raised in the mines! The mine is my life.” Mine work is highly accessible for women in rural Central Africa. It has low barriers to entry and is usually situated near women’s homes, often only a few hundred meters away. The proximity is an important motivating factor in women’s participation. Dana lives a mere 15-minute walk from the mine she works at in Rwanda. Pascale in DRC lives right beside the *carrière* (mine site), not more than 500 meters away. These women are not migrant labourers but work in mining because the mines are in their backyards. This is very different from large-scale industrial mining operations in DRC (Rubbers 2019) and other parts of Africa, notably South Africa (Moodie and Ndatshe 1994; Harries 1994; Crush, Jeeves, and Yudelman 1991), which rely heavily on migrant labour. It is also different from other artisanal mining contexts, where scholars have noted high rates of migration to mining communities, especially amongst men (Cuvelier 2017; Bashwira and van der Haar 2020).

For women like this, accessibility is not only a function of distance but also of cost. They can start working without upfront investment (formal or informal fees), with minimal equipment and without experience. Most learn how to mine by observing others, usually friends or family members. Pascale told me she learned from her husband. Another participant in DRC learned from her sister. Rosalie, who conducts shovelling work and who I discuss more in Chapter Six, told me she learned by watching men at the site. Mireille and other respondents reported learning from other women at the site, in a gendered solidarity. These minimal barriers to entry in artisanal mining have been noted by others, whereby “a miner’s first work site is an apprenticeship”(Bryceson and Jønsson 2010, 380). Mine work is also more appealing to women who have low levels of education. As one interview respondent put it rhetorically in Kiswahili *“Ninaweza tumika mu carrière*

kweli nanili somoko?": i.e. "How could I work in the mine if I had studied?" Similarly, a respondent in Rwanda said, "the mines make it hard for people to finish school here!"

In sum, women described the accessibility of mine work relating to proximity to their homes, as a job they could learn by doing and which did not require high levels of education and lastly, work that requires little upfront investment or equipment.

Intergenerational, Kinship and Community Influences

Women often worked in conjunction with kinship networks. I met siblings, friends, relatives and couples who all worked together in mining in both counties. This section first provides several examples from DRC, then for the remaining discussion focuses on the Rwandan context.

In DRC, Natalie told me her eldest daughter, 15 years old, also works in mining but for tourmaline (a high value gemstone) at a nearby artisanal mine site. I interviewed a young woman in DRC who told me she and her sister often work together, even walking to the mine site together. Since the labour context of DRC is not a centralised hiring process of mine workers through companies but one where miners work independently, these social relationships and connections assisted with women's transitions into mine work.

In Rwanda it was very common to find instances of intergenerational mining and many members of families working together in mining. Dana's mother also worked in mining for seven years at the same site (although at the time it was owned by a different company), working underground and in the physical extraction of minerals. Although Dana did not attribute her work in the mines to her mother's influence, the fact that both of them worked in the mine is a reflection of how mine work has permeated across generations and is deeply rooted in Central African mining communities. Celeste, a 63-year-old miner, who was born and raised in the village where the mine is, told me her father used to work at the mines before his death and that her three cousins and her maternal uncle all work together at the same mine. Even younger women who were themselves new to mining work often had relatives who had worked or continue to work in mining. Twenty-two-year-

old Sarah, who was born and raised in the village close to the mine on which she works as a subcontracted worker, had worked in mining for only five months but was familiar with mining because her father had worked in this same mine. He had been fired a few years prior, accused of stealing blasting wires, a crime she said he did not commit. Both of her grandfathers had also worked in this mine. Similar to Dana, intergenerational mining was not her motivation to enter mine work but does speak to the generational connections between the mine and the community. It further reflects the mine's longevity in the community as the primary employer and regional economic driver.

Karen, who is 33 years old and works in a more technical position for the mining company in Rwanda, told me her father, great grandfather and two uncles all worked in mining. As she noted, "My great grandfather came here with the Belgians from Katanga. He was actually Tanzanian and spoke many languages and did translation for them [the Belgians]. My father worked as a mine supervisor for a subcontractor company before." She told me her two uncles had also worked in the mine, but she did not know them because they were killed during the Genocide. She knew they worked formally for the company because their names are engraved on a Genocide commemoration stone found at the mine site.

One afternoon she showed me around the grounds of the mine in Rwanda. Woven through the forested mine camp were colonial style houses that had been built in an earlier era for the mine managers and a deserted recreation hall, clearly built as a bar and entertainment area for mine management. These houses are now occupied by the management team employed by the mining company, all of whom are white South African men. As we walked, she pointed to a small house down an embankment near the main mine camp and said, "This is where I was born. In that house. My father still lives there." As in Congolese mines, there was no fence or physical barriers or boundary between the mine and the surrounding community. While the company did have security guards patrolling throughout the perimeters of all their mines, the geographic distances of the concessions were simply too big to be gated. While there were gates for the main entrance of the mine camps, these gates did not extend beyond the first point of entry into the mine camp. Some artisanal sites that were being developed during my fieldwork

took 45 minutes to an hour to drive to, and were all considered part of the same “mine site.”

The blending of the community and mines is not a new phenomenon. Celeste told me “There have always been minerals in our farms, the tunnels are in our farms. It’s by default that everyone works in mining here.” Celeste has worked in mining for many years. She is now a team leader and has been formally employed by the mining company for five years but worked in what she described as “illegal mining” before her formal employment.

Many respondents described historic periods of – in their words - “illegal mining,” as when mine sites did not have formal company ownership or during periods owned by different companies. However, extraction continued during these periods on an individual basis and in a less regulated environment. These periods of so-called illegal mining were also strongly associated with the concept of artisanal extraction (without machinery), perceived as disorderly, juxtaposed against the current period of more modern mining (with machinery). When I used the words “artisanal mining” during interviews or conversations with participants, respondents frequently replaced “artisanal mining” with the term “illegal mining” in conversations that followed. This reflects a strong distinction between artisanal mining versus small-scale semi-mechanised mining, interpreted to hold different social dynamics and stereotypes. Periods of so-called “illegal mining” were described as an imagined historic period that occurred distinctly in the past, which used artisanal mining techniques and was associated with disorder, delinquency and illegality. This was described in tension with the present period, reflecting a contemporary shift to a more formalised, modernised and orderly period of mining. This choice of term (illegal mining instead of artisanal mining) reiterates government and company narratives which seek to depart from the term “artisanal mining” because of the negative stereotypes it evokes, that of illegality and delinquent behaviours. Master narratives in Rwanda today emphasise the benefits of privatisation and formalisation as fostering better and safter working conditions and a more prosperous, developed, modern and orderly mining environment and, more broadly, society. It also reflects common societal perceptions about artisanal mining as having a negative impact on communities. Here a rupture

emerges within participants' narratives, from past periods of disorder and illegality to current periods of modernisation and development in mining.

"Connections" and Formality

Due to the more formal working context in Rwanda, social relations (or their lack) emerged as an important factor in women's access to mine work. This was not the case in DRC where the working context is highly independent and does not follow the same hiring system by mine companies. As a result, this section focuses exclusively on Rwanda.

As Dana and I walked in an underground mining tunnel having just started the afternoon shift, she told me her reasons for entering mine work. "In [this village] all you can do is work in the mine or in construction. I didn't have connections to get a job in construction, so I came to the mine." She, like many other women, used to make and sell traditionally fermented banana beer in the village, but she did not make enough money to sustain her household (recall, she lives with her mother and two sons) through the work and so looked to other options. Dana was not the only respondent who cited a lack of "connections" as a reason to turn to the mines. Josephine also said "I didn't have any connections so I couldn't work in any other local sector, like maybe construction. I just needed a job." By "connections" both women meant knowing someone, whether a friend or family member, who already worked in construction and who could assist in securing them a job. These "connections" which then translate into economic opportunities are a defining feature of social capital as defined by Bourdieu (1986). These examples suggest that the more formalised work environment of the mine (e.g., formal hiring processes) increases women's access to mine work, eliminating the need for "connections" to get a job. They did not require someone to put in a good word for them or advocate on their behalf because they could access open hiring practices through the mining company. This was only observed in Rwanda since artisanal miners in DRC are not formally employed by mining companies.

The Rwandan mining company in this study was highly centralised and formalised, with a governance structure including a board of directors, international financial backing and very distinct departments with multiple employees in each and with a centralised head office. The company operated through a formalised hiring process, described by all participants in a similar way. This included a formal job application process with the requirement to provide government issued ID, proof of a bank account, a cover letter, CV and proof of COVID-19 vaccination. The level of formalisation within the company created a hiring process that bypasses kinship ties, social capital or the need for any "connections." Access to work is more dependent on meeting the job requirements, notably the formalities and paperwork channelled through the Human Resources department. However, this also fosters a point of exclusion for women who may lack the administrative skills, education or resources to acquire these documents. Nevertheless, respondents argued that the mine company formality enhanced access to mine work for women who stated they had no prior experience in mining or lacked mining "connections."

Government Intervention

In Rwanda many women who held technical and specialised positions directly attributed their careers in mine work to government programs and initiatives that have promoted the mining sector and gender equality within it. Again, this was not the case in DRC where the working context is less formal. For example, ASM sites in DRC rarely have geologists or surveyor's present. As a result, this section also focuses exclusively on Rwanda.

Lisa is 31 years old and works in a highly specialised position. She studied mining engineering at college in Kigali. However, her choice of mining engineering emerged through a series of life events, which she described as "an accident." Under the Rwandan high school system, pupils must choose to specialise in either humanities or sciences for the last three years of schooling. She chose to specialise in math, physics and chemistry, with the hopes of becoming a pilot or work in aviation. Although she performed well in high school, she became extremely ill with typhoid in her last year and missed five months of school. As a result, she barely passed the national exam and was not accepted

to university, nor could she get a scholarship. In search of a higher education, she went to a local college in hopes of pursing engineering or a science-based program. “They said to me, there is a new school called mining,” she explained, and learned that they could accept her with her marks. The school told her that conveniently, it was “starting now in March.” She explained “I didn’t know anything about mining. The first time I went into a [mine] tunnel was with my class.” During her studies she participated in unpaid internships with various mining companies, which eventually transitioned into a job.

Audrey is a 24-year-old mining engineer who studied at the University of Rwanda. Like Lisa she specialised during high school in math, physics and computer science, stating “I like to do hard things!” And, also like Lisa, Audrey came to mining unexpectedly, in part because of the conjuncture of completing high school and the Rwandan government’s new policies on mining and promotion of the sector. Her initial interest was in computer science, but she could not afford a laptop and knew that factor would be prohibitive in her aspirations to pursue computer science properly. “I didn’t have the means, so knew it wasn’t going to work for me.” She said since mining was “an upcoming thing that government was pushing and there were no educated people in the sector” it interested her. Where she studied high school was also near a mine and she would see mine workers there and talked to them. She said “they told me I could get rich by working in mining. So, I thought, why not try? If my country is really pushing this, why can’t I?” She did well in high school and got financial support from the Imbuto Foundation.[30] In her class she said there were 8-11 other women. They were the third cohort of students. She conducted an unpaid internship during her studies which also transitioned into a job.

Both women entered the mining sector by what they descried as an “accident” or due to circumstances. What we see here is the confluence of individual lives and historical circumstances: shifts in Rwandan economic policy and intervention had a direct link to the opportunities available to them, shifting their interests when the opportunities were presented to them. Individually, they both faced unexpected interruptions to their future hopes and plans for their next stage in life (careers after high school) due to illness or

[30] A foundation established by the First Lady of Rwanda. See: https://www.imbutofoundation.org

financial restrictions. This confluence of aspirations and uncertainty affecting life stages, which created the circumstances for which they both ended up in mine work, reflects Jennifer Johnson-Hanks' conceptualisation of vital conjunctures (2002; 2016). For Johnson-Hanks vital conjunctures are "moments when seemingly established futures are called into question" (2002, 878), moments which are unforeseen and the result of the confluence of multiple factors but, importantly, are not permanent and which in many ways open up new possibilities in life (2016). In other words, unpredictability shifts our life course due to the confluence of multiple factors, which was the case amongst women in these highly specialised mining positions.

"I Like Adventure!": Motivations for Work in Downstream Production Roles

Hélène told me she worked in mining in Rwanda because, as she put it, "I like adventure!" At 42 years old, Hélène has worked in mining for three years and is the owner of a subcontracted company. She recounted that she had previously worked as a cashier in a bank but quit due to job dissatisfaction. It was later, through an acquaintance who had some mining knowledge, that she was encouraged to get into mine work. "Now I can never *not* work in mining!" she said with a laugh.

Elise has owned a mine in Rwanda for 28 years and said "I like mining! It has provided a living for me." Elise employs 370 permanent and casual workers, including 50 women. She is 47 years old and married with three sons, one of whom she supports financially to study at university in Canada. She hopes her second oldest son will also study in Canada. Her husband is a member of the military and is not involved with her business at all. She finished primary school and two years of high school before dropping out because her family "did not have the means" for her to continue. Despite this, she later found work as a nurse. She described being dissatisfied with the low salary in the position, wanting to change professions. She had heard people could make a lot of money through mining and approached a friend for "information and introductions." They visited a mine site together where she could "see how they work there." She located an area to start her mine company based on where "artisanal miners were working." She took "a large stone" from that area where artisanal miners worked and had a geologist check it. The geologist told

her it was tungsten and she immediately “started looking for buyers in Kigali,” having some existing knowledge of minerals and mining from her friend who had assisted her in the beginning.

Her friend organised a meeting with the minister of mines at the time. Through this meeting she was given a mining license for a period of six months, a much shorter timeframe than usual, as mining licenses are usually granted for periods of between 5 and 15 years. She attributed the short license period to the fact that she was a woman. She explained, “As a woman they thought my business would fail. They would come check on the mine and soon they saw I was succeeding. Then I started getting licenses for one year, two years, three years and then five years. Now I have a license for ten years. I was very committed to the business!” At this time there was no fee for the license, and she said the process in the beginning was “free and easy. All you had to do was show the ministry where you wanted to mine and that it was suitable for mining.” Now she said the licensing process “takes a long time and is complicated.” Throughout her entry into mine work she said, “my friend showed me the way.” Elise shows us how “connections” and social capital manifest and aid women in access to extractivist work, especially in high-income earning positions. While women miners looked to mine work because they lacked the connections necessary to secure jobs for other sectors, in downstream production roles women relied on and leveraged connections and social capital in order to access positions.

Other women in Rwanda, introduced in Chapter Three, described similar trajectories. Camille was introduced to the mining industry “by accident” after getting a job with the Rwanda Mines, Petroleum and Gas Board (RMB), sparking her interest in mine ownership. Sylvie was interested in mine work through a friend, while holding a job at a bank. She and her husband now work together in the business. Madelaine on the other hand, who started a cooperative, was inspired to enter mine work due to intergenerational influences, since her father worked in mining and was “a great inspiration.” She also had strong connections to the rural community where the mine was situated and looked to mine work after she quit her salaried employment for the government. Danielle who worked in mineral transport, was first inspired to work in extractivism by her sister. She

was later invited by a friend to a training led by South Africans on how to conduct mineral analysis with specialised equipment. Her training eventually led to employment at an export house, and she was later hired by a "family friend," who was a mine owner, impressed by her expertise and skill in mineral analysis. These accounts and those I have offered in Chapter Three demonstrate how social capital or its lack, the confluence of changing government policy and individual lives, and chance emerge as factors that motivate and enable women to enter mine work.

There was one other important dimension to how women entered the downstream production and distribution roles of the 3T mineral supply chain, and that, as with women miners described earlier, had to do with kinship. Kinship networks, largely premised on notions of trust, facilitated women's access to jobs in downstream production roles. The case of Jessica, who works in the export house in Kigali, provides a telling example of this. She was first introduced to mine work through her sister and then eventually hired by her second cousin, the export house owner. She was very aware of this, saying "normally in mining it requires people you trust because people can steal. So, in mining you often find many family members working together." Sylvie, who owned a subcontracted company, said she preferred working with her husband because they could "trust each other", "especially to manage anyone who steals minerals." While of course family members could and do steal from each other, individuals in positions of power, such as mine owners or export house owners (both men and women), preferred hiring family members on the grounds of trust. The belief that family members are more trustworthy is related to the broader societal atmosphere of distrust, fear and silencing in Rwanda, (as discussed in Chapter Two). Within a context of distrust, respondents perceived family members as more trusting, especially in high-income earning positions where more financial risk is involved. It also shows how for women in downstream production roles, kinship translated to economic opportunities through the form of jobs.

Given this discussion, Table Two below provides a summary of the pathways and motivating factors associated with women's choices to enter extractive work along the different nodes of the supply chain.

POSITION	PATHWAYS TO MINE WORK	REASONS FOR CHOICE
Mine Worker **Nodes 1 and 2**	• Geographic proximity • Convenience and familiarity • Low barrier entry • Kinship • Intergenerational influences • Government intervention	• Economic necessity • Higher profits than agriculture • Accessibility • Lack of education • Mine work provides more formal (and equal) hiring practices • No need for "connections" as is found in other industries
Mine Owner **Node 3**	• Chance or luck • Availability of substantial personal economic resources (money and assets) • Existing industry knowledge • Social Capital • Kinship: Familial support or networks • Landownership • Trust	• Economic opportunity: Significantly higher income generation • Increased opportunities for business expansion • Enhanced quality of life • Adventure • Improved quality of life
Subcontractor Company Owner **Node 3**	• Chance or luck • Access to information channels • Social capital • Economic stability and access to resources (assets and capital) • Kinship: Familial support or networks • Trust	• Economic opportunity: higher income generation • Ability and interest to expand and invest in mining businesses • Enhanced quality of life • Access to land
Head of Cooperatives **Node 3**	• Kinship: Familial support or networks • Social Capital • Strong connections to rural communities where mines are located • Some economic stability • Intergenerational influences	• Enhanced quality of life • Community development • Economic opportunity
Transport **Node 4**	• Chance • Kinship: Familial support or networks • Social Capital • Income generation to support other activities • Trust	• Economic opportunity • Familial obligations and opportunities • Existing industry knowledge • Education
Export House **Node 5**	• Kinship: Familial support or networks • Chance • Income generation to support other activities • Social Capital • Trust	• Economic opportunity • Convenience • Accessibility through kinship • Existing industry knowledge • Education

Table 2: Summary of women's pathways into mine work and downstream production roles

Conclusion

Women's pathways into mine work and downstream production roles are driven by multiple motivating and circumstantial factors. In mining those factors include economic necessity, geographic proximity between mine sites and homes, accessibility, formality, government intervention, kinship, intergenerational influences and negative social capital (Wacquant 1998). For women in downstream production roles, there was greater emphasis placed on economic opportunities (not necessity), kinship networks and social capital (Bourdieu 1986).

Focusing on the pathways of female mine workers, those working in the physical extraction and processing of minerals, some of the data presented in this chapter aligns with existing literature. That literature has centred around economic necessity and accessibility as primary motivations (Bashwira and van der Haar 2020). However, an important distinction emerges in this study, that of migration and migratory patterns. Counter to scholarly literature from Central Africa and Africa more broadly (Cuvelier 2017; Rubbers 2019; Moodie and Ndatshe 1994), the majority of female mine workers in this study were *not* migrant labourers but born and raised in the communities where they conduct mine work. Those who did move to mining communities, like Mireille, moved from very close distances or even from other mining communities, like with the case of Pascale who moved from 10kms away, also a mining community. The familiarity of mine work and close geographic proximity between women's homes and mines compounds the sector's accessibility for women. In other words, the fact that women grow up around mines makes the sector conveniently situated, familiar and accessible, contributing to the high concentration of female workers at mine sites in Central Africa.

The differences between women's pathways into low-income (mines) and high-income (downstream) earning positions along the supply chain can be attributed to multiple factors. Women in downstream production roles lived in urban areas, not as geographically close to mine, and held existing salaried jobs. They lived in a more stable socio-economic context before choosing extractive work, compared to women who worked directly in mineral extraction at mine sites. Some women who work in

downstream production roles owned farms and "found" minerals on those farms, leading to business development and entrepreneurship in mining. Importantly women in downstream production roles did not look to extractive work as the only option for an income. Rather they chose extractive work because of the economic opportunities the sector provides, even when holding existing jobs and at great financial risk to themselves and their families. In contrast women who worked at mine sites in physical extraction and processing of minerals did so out of economic necessity, or as they put it "just for the money," even when they did not like the work or would have rather engaged in other work. Here, I argue, emerges a difference between economic necessity and economic opportunity. Economic necessity refers to choosing mine work in the face of limited economic alternatives. While it is a choice, the choice is limited. Economic opportunity refers to women who have multiple choices but still choose mine work, primarily because they imagine significant profits and upward economic mobility.

The presence or absence of social capital was also a significant factor that distinguishes women's access to work between mine workers (nodes one and two of the supply chain) and downstream production roles (nodes three to five). This was evident in the case of women working in downstream production roles. Through kinship networks including family, friends and trusted mentors, they accessed opportunities in extractivism which otherwise would not have been available to them, and which directly translated into economic opportunities through jobs or the establishment of thriving businesses. Through friends, acquaintances and contacts, women were able to access information and the knowledge necessary to start their businesses, whether as mine owners or in starting collectives.

On the other hand, women working as mine workers did so due to, what Loïc Wacquant calls, "negative social capital" (1998). Women at mine sites turned to mine work because, in their words, they lacked the "connections" to get jobs in other sectors. It was precisely because the formality of Rwandan mines, which did not require social capital, that meant they were able to secure a job. While many women were inspired and connected to mine work through family, including fathers, mothers, grandfathers and sisters, women did not attribute the reason they could work in mining because of those

influences. Rather amongst mine workers it was the formal and equal hiring practices of the mine company that facilitated their work in mining, precisely because of negative social capital. In other words, these kinship influences did not translate to jobs, as they did amongst women in downstream production roles. However, these influences did inform historic connections to the sector and make mine work a familiar job choice. Here I argue that women in downstream production roles required social capital to work in extractivism, while for mine workers it was the absence of social capital, the presence of negative social capital, that motivated women to work in mining.

However, there is a distinction here between the Congolese and Rwandan context for miners. In DRC women were motivated to work in mining because of kinship networks; for example a participant attributed her work in the mines to her sister who also worked there. In that case, kinship connections (and by extension social capital) did translate into economic opportunity, or at least access to the sector. This is largely due to the informality of DRC mines, where miners work for themselves in their own time and rhythm, with their own equipment and upfront capital. They are not hired formally by mining companies. On the other hand, in Rwanda similar (and even more extensive) kinship connections existed but did not translate to securing a job in mine work. Even though these kinship networks normalised and familiarised the mining industry as a viable job opportunity, women did not attribute their work in mining to those kinship networks, as they did in DRC. As discussed, in Rwanda it was the lack of "connections," despite kinship networks, that motivated women to go work in the mines. In the more formal hiring environment in Rwanda, negative social capital motivated women to work in mining.

This chapter also shows how policy intervention from government has an impact on the lives of those working in the sector or who has access to the sector. Women ended up in technical and specialised positions by what they described as an "accident." That "accident" was in fact the result of the confluence of government policy and priorities and their individual lives and networks. They were able to access these opportunities and government priorities because they had access to higher education. As discussed in the Introduction Chapter, Rwanda has a highly ambitious and detailed policy intervention in

promoting women in mining and gender equality more broadly. The government has also made efforts to invest in university and higher education programs and facilities that promote specialised mining skills and education to build local skill and expertise. This was not the case in DRC, where gender equality is not considered much in legislation and women are more actively excluded from mine work and spaces due to social factors. While it is not possible to do a comparative analysis between the two countries because women who work in high-income earning positions in DRC are not included in this dissertation (due to the constraints around fieldsite access outlined in Chapter Two), it is still observable that government intervention can have a positive impact on women participation in mining and extractive industries more broadly, as seen through the case in Rwanda.

As discussed in the Introduction Chapter, there is a pervasive belief that Rwanda does not have a domestic mining industry and that all minerals are smuggled from neighbouring DRC. I problematised this in the Introduction Chapter, noting that while mineral smuggling does occur, it occurs alongside a domestic minerals industry, and these two factors are not mutually exclusive. Through an exploration of women's pathways into extractivism, we have seen that, counter to the narrative that all minerals from Rwanda come from DRC, there are in fact many instances of intergenerational mining and histories of mining within families, reflecting a deeply rooted industry in Rwanda. Many women had family members who worked in mining, not only within generations (such as sisters), but across multiple generations (such as uncles, fathers and grandfathers, stretching back three, four or more generations). Karen is a telling example of this. Her father and grandfather worked in mining, which inspired her to take up work in the sector. While there were more examples of men and male family members working across generations, this also occurred amongst female family members. Dana and her mother both worked in mining, in the same community and same mine site, although during different periods of time. This highlights that intergenerational mining has a strong history and legacy in Rwanda, not only amongst men but also women, further emphasising a long history of domestic mining in the country.

Women's pathways into extractivist work further assist in (en)gendering the 3T mineral supply chain. As discussed, mine work is highly accessible for women and provides income in the face of limited economic alternatives. Mines are also found near women's homes. These combined factors were highly motivating for women to seek work in mines. As a result, we see a high concentration of women labourers at mine sites conducting the physical extraction and processing of minerals, nodes one and two of the supply chain. Looking to downstream production roles, nodes three to five, fewer women are able to access these positions, such as working at export houses or in mine ownership. This is because, as we have seen, women required existing incomes, higher levels of education, strong kinship connections and high degrees of social capital in order to access these positions. This increases the barriers to entry for women who do not have access to these networks or existing financial security. Women at nodes one and two were born, raised and live in rural areas, compared to women in downstream production roles who lived in urban centres. Here we see how broader social factors, such as socio-economic status, geographic positions (urban versus rural) and access to education impact gendered dimensions of the supply chain. As a result, broader gendered inequalities in society, such as educational gaps, impact where women are active along the 3T mineral supply and who benefits most from extractivism within extractive frontiers. Turning to benefits and sites of value within and along the supply chain, Chapter Five will explore women's vulnerabilities in mine work and barriers to work, which also emerge as multiple and overlapping sites of violence.

CHAPTER FIVE: EXTRACTIVE VIOLENCES ALONG AN EXTRACTIVE FRONTIER: GENDERED VULNERABILITIES AND BARRIERS TO WORK

In a focus group discussion, a participant explained her difficulty balancing motherhood responsibilities with her work in the mines, stating:

> *"When I first started working here I had nowhere to leave my kids. I had a neighbour who was home during the day and could take care of the children. It's very difficult because we can't leave our children at home alone."*

Women in this study experienced distinctly gendered vulnerabilities and barriers to work, as this opening quote reveals. This chapter explores how these factors foster various forms of extractive violences, including experiences of exploitation, disposability and embodied violence. Women were at times required to pay a "fee" to access mine sites in order to work, policed by male gatekeepers. They also faced instances of sexual harassment and exploitation, often coerced or forced into transactional sex. Women faced barriers to work and challenges in retention of work due to pregnancy and childbirth; they were expected to separate their identities as mothers and miners. Women also experienced negative health effects due to mine toxicity, which directly impacted their reproductive health within the context of tungsten extraction.

This chapter answers the sub-question: What gendered vulnerabilities and barriers do women face? What are the implications of these experiences? In answering these questions it provides two primary insights. 1) It describes women's vulnerabilities and barriers to work which are distinctly gendered and, 2) It analyses these experiences collectively to better understand how women experience violence in their everyday work and what implications that holds. This chapter further sheds light on how legal frameworks in extractivism impact women in negative ways. It also adds gendered considerations to the existing "fend-for-yourself" economic system in DRC.

I argue that the vulnerabilities and barriers to work that women experience foster extractive violences through overlapping experiences of exploitation, disposability and

embodied violence. I conceive of violence in broad terms, as a continuum, to encompass its multiple overt and covert forms, many of which have already been discussed in this dissertation. Violence includes an action or an event that is immediate, for example, warfare or a physical fight. It also includes "everyday violence" (Nordstrom and Robben 1995), as discussed in Chapter Two, meaning subtle forms of violence beyond conflict, including the threat of violence which possesses psychological, political and intellectual dimensions (Nordstrom and Robben 1995; Scheper-Hughes 1992). "Everyday violence" includes things like political oppression or living in a state of terror (Nordstrom and Robben 1995; Taussig 1992). The continuum of violence also includes "slow violence" conceptualised by Rob Nixon, as "violence that occurs gradually and out of sight, a violence of delayed destruction" (2011, 2). Slow violences are most often associated with the long-term negative effects of environmental destruction and climate change, such as long-term exposure to toxic mine waste, which Nixion argues disproportionately affects the world's poor (2011). Slow violence is essentially invisible in the moment, unlike overt violence, but equally grievous. Collectively, we can understand violence as an immediate experience, the threat of a violent experience and a long-term experience of violence. These multiple layers and forms of violence are also interconnected and embodied experiences. They share a common denominator, that of disposability and dehumanisation. They are experiences that affect the mind, body and state of being. For this reason, I describe violence as a continuum. With this broad conceptualisation of violence, this chapter will show that women's experiences of violence are both a process and an experience.

The multiple and various forms of violence women experience associated with their work in extractivism form extractive violences, which are rooted in "extractive logics" (Murrey and Mollett 2023), premised on human disposability, dispossession, displacement and larger forms of neocolonialism and domination. Amber Murrey and Sharlene Mollett conceptualise extractivism as "intersecting sets of logics, material practices and forms of violence that sustain, sanction and preserve uneven economic, social and ecological relations within the colonial matrix of power" (2023, 769). Within this matrix, "extractive logics" are "the unnamed, unquestioned, often contradictory, foundational epistemic frameworks that permit the seemingly-permanent structures and relations of removal,

destruction, and dehumanization that result from paradigms of extractivism" (2023, 769). Often extractive logics are rooted in development discourse that emphasises the benefits to communities and people on the frontlines of extractivism, largely justifying exploitative practices. The authors argue that one of the consequences of these "ways of thinking" are multiple experiences of embodied violence which greatly shape the life and death of residents along extractive frontiers, and which disproportionately negative effect women of colour in the Global South (2023). Extractive logics are further rooted in and strongly connected to colonial logics including, as conceptualised by Aimé Césaire (2000), the "thingification" of people and nature, meaning the modes through which relational entities become objectified and alienated such that they can be exploited.

Women's accounts of their work lives and challenges suggest four key areas of extractive violences. These were in terms of financial extortion, physical violence, toxic exposure and tensions between work and motherhood. These categories emerged from the data during fieldwork and were not predetermined. The experiences women shared with me, which I thematise into these four categories, were unexpected at the onset of fieldwork and emerged by following the lead and narratives of participants. These categories I further identified because of how widespread and common the experiences were amongst participants and across country contexts. For example, I did not plan to ask women directly about instances of sexual harassment associated with their work. However, participants frequently initiated conversations about experiences of sexual harassment and exploitation with me. Similarly, I had no initial plan to discuss health and toxicity in mines. It was only through my own experience of felling unwell during my fieldwork due to mine toxicity that women shared their own experiences of adverse health effects associated with mine work.

Material Violence: Gendered Extortion in the DRC

Alice is a 22-year-old miner in DRC who has worked in the mine for one year. She has two children aged three and one years old, whom she supports financially. She mines illegally, meaning without the required *carte de creuseur* (mine permit). She was born and raised in the village where the mine is located and learned to mine from a friend her age, hoping to earn a basic living. The second time I met Alice she was carrying a 25kg bag of *mchanga* (waste minerals) on her head which she acquired from male miners. She was going to take it home to wash and refine, in hopes that it would contain a few kilos of coltan which she could sell. She explained that when working with large quantities of minerals (25kgs and up), she washes and refines them from her home because her illegal status makes working within the *carrière* (mine site) risky. This is why, on that day, she was on her way home to continue working. She worried that mine site authorities, such as the Mine Police, could catch her if she stayed in the mine site, commenting "I can be arrested and taken to a holding cell behind the mine police office and must pay 25,000 CF" ($12.50 USD). Alice reported her earnings as 6000-12000 CF ($3-6 USD) over the course of a few days when working with small quantities like 0.5-1kg of coltan.

Some days later, I interviewed Alice as she worked refining coltan within the mine site. She explained that since she was working with such small quantities of minerals that day, only 1-2kgs, it was not worth it to work from home and she had opted to wash and refine minerals from within the *carrière*. I asked her what she does if mine site authorities come or try to catch her for working without a permit. As she answered, "I usually run away," two mine site authorities approached unexpectedly from behind a nearby trench. Alice immediately dropped everything she was doing and ran away, leaving her basin, magnet and minerals behind. The mine site authorities were community members I had come to know through my local research permission process. We greeted each other warmly and they invited her back, saying "you won't get in trouble today." My positionality as a white western researcher may have impacted the men's openness in allowing Alice to continue working that day but nevertheless reveals a male gatekeeping to women's work in the mines. Later, Alice explained to me that she is required to pay "a fee" of 2000 CF ($1 USD) per week to mine site authorities to continue to work in the *carrière*, which she had not

paid for some time. She did not describe this as a bribe because she mines illegally, but rather as “a fee,” which she resented having to pay but that all women are required to pay.

This gendered “fee” was described to me in more detail some days later when I stumbled into a community meeting in the village next to the mine. Fifty-nine members of the community, including nine women, gathered on the grass in an open field beside the mine site on a Friday morning for a community meeting. At the front were ten men sitting in chairs, representing various community and mine authorities such as the Mine Police, a representative of the mining branch of government, a representative of COOPERAMMA (an artisanal miners association), pit owners, amongst other positions. I sat at the back with three women, one of whom I was told was the official “women’s representative” for the meeting. She was described to me as “the one who can speak for women at the meeting”. While the meeting consisted primarily of miners, local merchants and community residents were also present. The meeting had been called to discuss the repair of the narrow wooden bridges along walking paths leading in and out of the village, many of which were almost impassable. The village and mines in the area are only accessible by foot or with a moto-taxi (the most common form of public transport), as there are no roads big enough for a vehicle leading to the area. The male leaders of the meeting proposed a date for everyone to come together and repair the bridges and a $5 USD contribution from all the miners and community members to purchase wood to fix the bridges. The leaders told the group that they would collect this contribution from everyone, going door-to-door in the village. Women were exempted from having to pay the proposed $5 USD contribution or engage in the labour of fixing the bridges, the reasons for which I discuss below. The discussion of the group centred around communal dissatisfaction that cows, owned by local pastoralists, caused destruction of the wooden bridges. According to the people present, that was why the bridges were in a bad state, and they were aggrieved that they were being asked to pay for repairs. Male community members asked, “How will we protect the repaired bridges from future damage from cows?” The leaders of the meeting, seated at the front, assured the group they would consult with local traditional chiefs, *Mwami*, to discuss this issue and try to resolve it locally. Others present expressed dissatisfaction that they all had to pay the

same contribution, with one community member stating "We all have different incomes. Some of us don't have $5 to give!"

After an hour and a half, the meeting was called to a close, with everyone in agreement that the following Monday, instead of going to work in the mine, the men would all meet to repair the bridges. Indeed, the following week the bridges were repaired.

On three occasions during the meeting, the "women's representative" had put up her hand and tried to speak up and contribute to the discussion. On all three occasions she was directly denied the chance to speak by the male authorities at the front. In a follow-up interview with her she told me that she had wanted to propose that the women miners also contribute the $5 USD, "like everyone else," but then be exempt from having to pay a weekly 2000 CF ($1 USD) "fee" to Mine Police for women to be able to work in the mines. She explained the payment as "an amount we are forced to pay" and as something "only women pay to be allowed to work in the *carrière*." She added, "I wanted to ask them why we [women] must pay? We are forced to pay 2000 CF per week to the Mine Police." She wanted to raise this issue at the meeting because "…We don't have that money! We work to support our children." When I pressed her about why only women are required to pay this fee, she said "I don't know why we have to pay…they [mine police] say women are not allowed in the *carrière*. They [mine police] say to us -- you as a woman are NOT allowed in the *carrière*. Pay or we lock you up!"

Women described this payment to me as "*frais*" ("fee" in English), required for them to be "allowed in" to the *carrière*. As they explained to me, it was essentially a fee to access the mine site – in other words, a "fee to work." It was also described in gendered terms, levied only against women. Recall from Chapter Three that some women work from their homes, like Pascale, so this fee was only applicable to women who went into the mine site, even if only to buy minerals to refine at home.

Once aware of this fee, I discussed it with respondents. Women consistently confirmed that they were required to pay it, expressed resentment towards the payment, believing it unjustified, and shared that they often had trouble paying because they could not afford

it. It is worth nothing that, as Alice had explained, respondents did not consider this fee to be a bribe, the payment of which would have enabled them to work without the required mine permits or for other reasons. Rather, they saw it as a form of extortion. As the women's representative explained to me, they did not understand why they had to pay it or why their presence in the mines was "not allowed" to begin with. In this case, the fee, as a form of "fee to work," negatively impacted their work and fostered a significant amount of fear and apprehension, including, as we saw with Alice, the fear of being "locked up" in jail. Despite the small size and isolated location of the village and mine site, to my surprise there was in fact a holding cell behind the small wooden Mine Police office, which the superintendent of the Mine Police said has been used to lock up men on various charges "like when they are very drunk in the *carrière*." Through our discussion he acknowledged that the gendered fee was widely known and implemented by Mine Police officers; however, he told me the police had not yet arrested a woman for not paying the fee.

Some male diggers also work without a permit at this site but were not required to pay the weekly amount. One male digger without a mine permit assured me that men who work in the mine did not pay this fee and emphatically confirmed that it was only targeted at women. He explained that male diggers manage to work full time in artisanal mining without a permit by paying pit owners (he reported an annual amount of $50) to work under the pit owner's permit, in addition to paying the pit owner a portion of their proceeds based on production. This is a common system of labour in DRC artisanal mines, in which multiple *creuseurs* (diggers) work under a single permit usually in the name of the pit owner (Geenen 2011a, 197). This system of labour is a reciprocal relationship between diggers and pit owners, benefiting all parties involved, and is normalised in DRC mines. Pit owners make more money through increased production by having more diggers work for them and diggers can make a living and work without having to purchase their own permit, which they cannot always afford. What the women described is very different: rather than a mutually beneficial and entrenched labour system, it is instead a distinct form of extortion. Women did not want to pay the fee, as was evident in the meeting in which they tried to eliminate it. This was also clear during our interviews, during which they also expressed a confusion as to why they even had to

pay it at all. This reveals a gendered vulnerability, gendered targeting and economic exclusion specifically affecting women.

Moreover, women specifically named Mine Police as the primary state authorities who engaged in this extortion, although they indicated that other mine authorities were also involved. Alice, for example, ran away from mine site authorities who were not Mine Police but who held significant power at the site and who likely collude with Mine Police (and financially benefit from) the enforcement of the fee. The fact that these same leaders did not allow women to express their grievances in the community meeting further reiterates their potential financial gain from the system. The money collected from women is kept by Mine Police officers and the women believe that it is likely shared with other state authorities at the mine site. Appendix Two consists of a breakdown of all mine site governance authorities present in DRC mines, showing the many different actors present who could potentially benefit from and leverage this extortion.

The "fee to work" further reveals a male gatekeeping to mine work, where women's labour is policed in a different way than that of men, who also work in the mine, whether legally or illegally. The justification by male authorities to charge the fee to women was on the basis that "women were not allowed in the *carrière*," but, as I have discussed, women have the full legal right in DRC to work in artisanal mines unless pregnant. There is no mention in the Mining Law (law no. 18/001) or Mining Regulations (decree no.18/024) that women are prohibited from mine work or from entering a mine site, or that a "fee to work" is required for any miner. The implementation of a fee by state authorities (specifically Mine Police) that targets women on legalistic grounds, claiming that "women are not *allowed* in the *carrière*," as if against the law, shows inconsistency in the implementation of the law and arbitrary law enforcement, which holds gendered dimensions and negatively affects women.

The implementation of this gendered fee was not consistent or unanimous. Mirielle, a 65-year-old miner, told me she did not have to pay the 2000 CF ($1 USD) monthly fee because of her age, stating "because of my age, they leave me alone." Moreover, fees of this nature had not been reported to me by respondents who worked in higher producing

mines closer to Rubaya during the fieldwork I conducted there in 2019. Women interviewed at that time, who also worked illegally, had reported that Mine Police specifically engaged in bribery (requesting bribes for working illegally), theft of minerals and physical beatings of female miners (Furniss 2021, 67). Women had individual responses to evade this abuse and vulnerability, such as running away or working with legal male miners, which, I have argued elsewhere, fostered an expression of infra-politics (Furniss 2023, 15). While this gendered fee is implemented differently, excluding the elderly and with differences between artisanal sites, the inconsistency itself demonstrates just how weak state law is in DRC and how individuals in positions of power can implement their own laws with gendered dimensions.

Furthermore, this fee reveals gendered dimensions of the broader economic order of the DRC and how local forms of authority and governance impact women. Raeymaekers et al. (2008) describe the everyday economic and political order of DRC as a system of "governance without government," in which local forms of governance and localised power dynamics create everyday order and authority, superseding centralised state authority. Mine Police are employees of the state who (at least in theory) should receive a monthly salary and who are responsible for increasing security, law and order at mine sites.

While not defending the actions of the Mine Police in this instance, their extortionary behaviour can be attributed to two primary contextual factors. First, it is likely that they are not paid their monthly salaries (or are grossly underpaid); second, there is what is locally known as *"l'économie de débrouillardise"* in DRC. State agents in DRC frequently do not receive their government salaries in full or on time, or are highly underpaid, contributing to a nationwide alternate economic system of bribery, looting and extortion. Janet MacGaffey and Vwakyanakazi Mukohya describe how many Congolese civil servants take government jobs despite the starvation wages, purely for the social capital these positions provide and for the subsequent opportunities for rent-seeking and for entry points into the "illegal" economy (MacGaffey and Mukohya 1991, 36-39). In a mining example, Christoph Vogel has discussed how SAESSCAM agents (state agents), who are responsible for technical support in the mines and partially for traceability measures,

often collude with miners and traders who engage in mineral fraud for their own financial gain in part because their salary payments are delayed for months (2018, 98). Recall from Chapter One that to assure conflict-free mineral sourcing, 3T's follow a bag and tag process where all minerals are packaged, tagged and registered with traceability agents to validate the origin of minerals and authenticate that their extraction and trade is not financing non-state armed groups. However, mineral fraud can manifest in multiple ways despite this system. Miners and traders will at times purchase traceability tags (which should be provided for free through a regulated process when minerals are properly sourced, and traceability measures followed) to tag minerals sourced from unvalidated sites. Or miners and traders can mix extracted minerals from validated and unvalidated sites, and claim they originated from validated sites. Both occurrences amount to mineral fraud as it invalidates "conflict-free" mineral sourcing. However, miners and traders do this in collusion with state authorities who, as just mentioned, financially gain from this process. In a separate study, Christoph Vogel et al. have shown using survey data with miners in South Kivu that taxation structures placed on miners, including illegal and legal taxation, hold significant ambiguity and that "extortive and rent-seeking practices" are widespread, particularly at the hands of state agents (Vogel, Musamba, and Radley 2018, 76). In an especially ironic example, survey respondents reported illegal taxation by anti-fraud services who collect illegal taxes from miners (Vogel, Musamba, and Radley 2018, 76). While respondents of the survey were majority male, it did also include women, showing that extra-legal taxation is not only premised on gender. This highlights that the practice of "illegal" taxation is widespread, entrenched in the local economic system and related to underpayment of state employees (Vogel, Musamba, and Radley 2018). Even in instances where Mine Police are paid additionally by private mining companies (either as a "top up" or through agreements with the National Police service), the actual payments received are minimal (Hönke 2010). This historical and contextual evidence provides insight into the economic context of DRC, particularly how the phenomenon of underpaid state servants dating back to the 1970's not only creates a system that normalises exploitative behaviour but also reinforces, enhances and fuels this behaviour, contributing to broader economic decline. With this context, we cannot be surprised by the example of financial extortion explored here but we can see how gendered dimensions emerge.

The fee reported by women also reflects *l'économie de débrouillardise* in DRC, the "economy of fending for yourself." *Débrouillez-vous* (fend for yourselves) rose as a collective economic practice in the 1970s amongst a backdrop of national economic collapse. Then President Mobutu Sese Seko famously said in a state address in the late 1970s, "if you must steal, then steal a little bit and leave a little bit for the nation" (Van Reybrouck and Garrett 2014, 389). This is satirically known as *"Système D"* (where the D stands for *débrouiller*, or the more vulgar *démerder*, to get oneself out of shit) or "*Article Quinze"* (referring to the fifteenth article of the constitution when in fact there are only fourteen). These terms articulate an alternative economic system reflecting everyday survival strategies. The *"débrouillez-vous"* economy is at the heart of what scholars have long termed the dual economy of the DRC, where informal economic activity surpasses centralised economic systems (MacGaffey and Mukohya 1991; MacGaffey 1986). The strength of the "informal" economy has brought some scholars to question if it is even worthwhile differentiating between the "formal" and "informal" economy, since the "formal" economy has almost disappeared (De Boeck 1996, 91). Scholars have also observed that the dual economy is more prominently entrenched in the Kivu Provinces, largely due to the eastern DRC's isolation from Kinshasa, leading people in the Kivu provinces to rely more heavily on "informal" economic activities (Jackson 2002). A combination of DRC's strong dual economy and arbitrary implementation of economic practices (as examples above have discussed) have both pushed women into informal economic activity but also made the dual economy an important space for economic opportunity for women. Janet MacGaffey has long argued that the "secondary economy" provides greater opportunities for women than the formal economy because, despite inclusive legislation, in practice women's active participation in formal channels is difficult (2019, 163).

Considering this economic norm in DRC, the added fee women face can be understood as part of the dual economic system and how Mine Police officers "fend for themselves" in light of the poverty and precarity they experience. It is no surprise that Mine Police (or any state or nonstate agent) would use their position of power and authority to engage in taxation for personal gain in this way, because this is the normal economic order in DRC.

However, despite the historical and contemporary contributing factors to the current economic system in the DRC, extra-legal taxation that is justified as part of the dual economy is not always accepted and is contested by individuals, as we have seen in both the desire of the "women's representative" to discuss the matter at the public meeting and in women's individual conversations with me. Women consistently rejected and resented the fee, considering it extortion, not a justified or socially accepted economic norm.

While understanding and recognising the motives and contextual factors that motivate a fee implemented by Mine Police, the experience of Alice and other participants shows a gendered dimension to the *"débrouillardise."* In the current study Mine Police officers only targeted female miners on the grounds of access and gender, stating that "women are not allowed in the mine," not on the grounds that women mine without a permit (as do men) or for any other reason. This framing reflects deeply rooted gendered ideologies about a women's place in society and particularly in (or out of) mine work, a narrative used to justify capitalising on and extorting female miners. It further speaks to male expressions of power and masculinity. Men decide who is "allowed" in the mine, as a form of gatekeeping, male control and to keep mining enclaves as male spaces despite national law. The justification for disallowing women to enter mine sites (attributed to gender) is a way for men to hold women in economic subordination by denying their ability to earn independent incomes. This subsequently exacerbates women's economic dependence on men, including their husbands. It further reflects male dominance within positions of authority in DRC, particularly amongst state agents, and subsequently a gendered hierarchy within positions of power that can easily facilitate exploitation. When considering these factors, we see how gender impacts the *"débrouillardise."*

However, the targeting and exploitation of miners by Mine Police (and mine site authorities more broadly) is not limited to women, as mentioned above (Vogel 2018; Vogel, Musamba, and Radley 2018). Scholars have noted that state agents often implement arbitrary taxation for access to mines on miners (Verbruggen, Francq, and Cuvelier 2011, 19), although this was documented during moments of political turmoil or heightened instability (Geenen 2012), rather than on a regular basis during periods of

relative security. For example, during a six month ban on all artisanal mining activity in North Kivu, South Kivu and Maniema in 2010 due to increased rebel control of mines, there were reports of state agents (including police) allowing miners to continue working but for a fee (Geenen 2012, 327). While this shows that a "fee to work" is not reserved for women and as discussed is deeply rooted in the *l'économie de débrouillardise*, it has historically been observed and discussed in contexts of heightened conflict and political tension or in relation to enforcement of traceability measures. The experience of Alice and other female miners shows that when these economic practices collide with gendered ideologies, they impact women's labour in the everyday differently, revealing how the work regime is gendered. The implementation of this weekly fee strongly impacts women's daily working context. They are negatively impacted by the burden of added fees to begin with, fostering an economic barrier, and are forced to flee from mine site authorities when unable to pay. This form of financial extortion is a material experience of exploitation within mine work, which is also an act of violence as it objectifies women as something (or someone) to be exploited.

Physical Violence: "I Have to Even Use My Body to Be Able to Work"

Throughout my fieldwork the issue of sexualised harassment and exploitation was raised by participants as impacting their everyday work and lives in both country contexts. However, women in DRC strongly rejected the presence of sexualised violence. On the other hand, in Rwanda, women shared experiences of sexual harassment and exploitation as an integrated experience of their everyday lives. Here, I focus on Rwanda, while engaging regional literature, and return to Congolese women's rejection of violence in the next chapter.

Audrey is a 24-year-old mining engineer who has worked for a Rwandan mining company for one year. While job shadowing Audrey one day, we visited a tunnel that was being developed, a vertical shaft 50 meters deep and built in a perfect square shape. Steep wooden stairs facilitated workers' movements up and down the tunnel. Audrey described

the technical side of her job to me with great pride, explaining how they design the tunnels to follow the mineral veins and deposits. In private moments while walking from tunnel to tunnel, she shared her mistrust for male managers and male staff members in positions of authority in the company. Her male manager, Nathan, had a bad reputation amongst female employees. “There was an incident where a female miner just told everyone one day at the mine that she and Nathan had sex. It triggered an inquiry with HR.” Similarly, she expressed her distrust for the union president, stating “he has many different children with women in the village and when new girls start working here, he approaches them unprofessionally.” She described this “unprofessionalism” as intimidating female employees to engage in sexual relations or risk losing their jobs, abusing his power and authority. Later, in an in-depth individual interview she told me of her personal experience of sexual intimidation and harassment from a male manager.

“For us women, supervisors will take advantage of you. They want to use you.” She said she refused sexual advances from male colleagues, including her male manager Nathan. “[Nathan] wanted to sleep with me but I refused and that is when tensions started between us at work. Now he says I'm a problem.” Continuing she explained:

> *“Here you have to be strong against sexual advances. You have to work extra hard…When you talk to other ladies they say, male miners say, ‘I’m your supervisor, give me this sexual favour or I will fire you.’ We try to tell women that supervisors can’t do that. They accept because they are single mothers. Women in these positions accept because the man will buy milk for their children or pay for the braids, so they can’t really refuse. Here in Rwanda it’s something that happens. Women say, ‘I have to even use my body to be able to work.’”*

Audrey was not the only female employee who reported this kind of behaviour from male colleagues. Karen who worked for a long time at the mine and was active on the women’s association committee, was seen as a leader amongst women at the site. She recounted experiences of sexual harassment and intimidation other women shared with her.

"Women call me and tell me. I know a woman who worked in security for the mine who resigned because her male supervisor was always asking to come visit her at her home. I said to her she should have come to talk to me before she resigned. I told her she didn't have to resign; the company could have put her in another department. But people don't trust HR and think that the HR person will gossip and tell their story to others. This sort of thing is happening to other women. Management knows."

Following this explanation, she showed me a WhatsApp message sent directly to the mine site General Manager from the female employee reporting sexual harassment, which was eventually forwarded to Karen.

"I know some women don't have their contracts renewed if they don't sleep with their male supervisor…I know a lady that happened to… who said no, and she was pregnant at the time and her contract wasn't renewed. They will always ask women if they have proof, which they never do. There are many cases of this, I hear this. Others are scared of the manager telling others. People don't talk about this. I even know someone who went to the union, but the union asked if they had proof and they didn't, so they did nothing. That lady resigned and it's not only her but other women too… It's also a problem that people don't know English because they can't tell managers who only speak English."

In another example, when asking a participant about challenges she faced in her work, she stated "sometimes men grab me or touch me inappropriately." My research assistant later told me she was shocked that the woman shared that information saying, "it is so rare for a woman to be open in Rwanda like that!"

In downstream production roles, harassment was also reported. Danielle who works in mineral transport said, "I have experiences of harassment." Although she did not elaborate on the forms of "harassment" she has experienced, she said "they don't show me respect!" in reference to the truck drivers. When asked if she ever travels with a female truck driver, she emphasised that all drivers are male. Since the transport of

minerals always includes one driver (male) and a security guard (also described as exclusively male), she is the only women at the company who does these trips, always with two men.

Amongst mine workers, the presence of sexualised harassment and exploitation was clearly reported by participants, perpetrated by male colleagues and by men in positions of relative power. These men are primarily in low-level positions (such as mine superintendent), not senior level managers (like mine site General Managers).

Two types of sexual harassment and exploitation emerge here. First sexualised harassment in the form of unwanted physical touching and verbal harassment, and secondly, instances of forced transactional sex. Regarding the former, female respondents reported that male colleagues in the mines grabbed and/or touched them inappropriately. I also witnessed such instances first-hand while underground in Rwanda, when on one occasion, a male miner physically grabbed a female colleague inappropriately, an action which she immediately and verbally expressed was unwanted. Women also reported more broadly, using Danielle's phrase, "experiences of harassment," in which male colleagues did not show women respect, implying verbal harassment.

Moreover, what has been described by women here can be classified as instances of coerced or forced transactional sex, which is common in the region. Transactional sex, the exchange of sex for money and/or gifts (Ranganathan et al. 2017, 2), has been well documented within and around mining communities in Central and East Africa, although is a much broader global phenomenon and occurs across sectors. In eastern DRC mines, scholars have noted similar instances where women have reported transactional sex as a requirement to obtain employment in mining and auxiliary positions, described as something they "must" do to access an income (J.T.D. Kelly, King-Close, and Perks 2014). In DRC scholars have highlighted that women commonly describe engaging in transactional sex out of desperation, which they argue also increases women's risk of physical and sexual violence (J.T.D. Kelly, King-Close, and Perks 2014, 103). In Rwanda, Laine Munir (2022) has also documented instances where female miners reported forced

transactional sex in order to keep or obtain a mining job and/or to have salaries released; respondents identified this as the most pervasive form of gender-based violence. Munir argues that women working in collectives or cooperatives did not experience improved protections against such violences despite the assumption that these formal organisations aid in protecting workers.

Of course, not all instances of transactional sex are exploitative. Academic literature on transactional sex in mining communities has also discussed women's agency and choice in the matter, arguing that emphasis on the potential for exploitation through these encounters oversimplifies the agency of women in mining communities (Mahy 2011). However, it is clear in the majority of cases in the present study that the grounds on which sexual advances arise were based on uneven power dynamics between male managers and female subordinates, as well as clearly unwanted advances. In two of the examples I have just provided, women quit their jobs rather than engage in sex with a manager. The imbalance of power between managers and subordinates makes these cases exploitative and coercive. However, consent also becomes blurred when, as Audrey explained, women accept gifts for their children in exchange for sex. Again, sex in exchange for gifts is not uncommon and has also been observed in other artisanal mining contexts, such as in Tanzania (Bryceson, Jønsson, and Verbrugge 2014, 98). Scholars have noted how easily "the lines between forced, coerced and transactional sex are blurred" in these situations and within uneven power dynamics (J.T.D. Kelly, King-Close, and Perks 2014, 103). In the present study, while some women accepted the gifts offered to them in exchange for sex, they did so because, in Audrey's words, "they are single mothers who have no choice." Again, there is an exploitative aspect to the situation because of the power imbalance in the relationship between female mine workers and male mine managers, exacerbated by poverty.

The sexualised harassment and exploitation described and analysed here is specific to mine sites and amongst mine workers in Rwanda, but exist alongside other forms of gender-based violence in society at large and within a context of regional conflict. The ways in which sexualised violence emerged as a theme in the study in Rwanda echoes much of the literature that highlights instances of exploitation and abuse. On the other

hand, Congolese women strongly rejected instances of sexualised violence within mines, standing in strong contrast to existing literature, even though sexualised violence associated with conflict and mining is well documented as occurring in Congolese mines (Meger 2010; Rustad, Østby, and Nordås 2016). As stated above, I discuss this rejection in detail in Chapter Six. Here we have seen how both the threat of violence (through the threat of forced transactional sex) and embodied forms of violence (through experiences of transactional sex) are experienced through sexual exploitation.

Mining and Motherhood: Lost investments

Every day at the main mine camp in Rwanda, senior level employees, mine management and consultants with technical expertise would eat lunch together, receiving a staff meal prepared by the company. This strictly excluded miners themselves and any subcontractors. I frequently joined the management team for these lunches, where I found myself in conversation with male staff members in senior management positions, as most managers were male. As was often the case, men who worked at the mines were intrigued as to why I focused only on women, excluding men, and usually wanted to share their opinions on "women in mining" with me. At the lunch table, Nathan, Audrey's boss and a mining engineer in his mid-thirties, expressed his views on hiring women. "Once subcontractors are hired by [the company] they stop working hard…they start being difficult. They get pregnant and can't work, they claim to have problems, they don't work as hard once they get hired…" He emphasised that "daily production," referring to the quantity of minerals extracted each day, was paramount for the company and anyone unable to contribute to that should be immediately fired. "Production for the company is the most important. If workers aren't making production, what is the point of having them?" A senior female member of staff jumped in on the conversation. "The company interests must come first. If she isn't making production, fire her." Nathan then explained what he does when he feels female employees are not working hard enough, which he determined based on his perception of women's contributions to daily production. "I confront them. They think I'm teasing them. They don't take me seriously and it's very

difficult for me. I'm being serious but they don't think I am, and they can get away with not working as hard."

Nathan was not the only respondent who emphasised the fear of pregnancy as a deterrent to hiring women and as a factor informing biases towards female workers. The following exert from an interview with Karen, who holds a specialty position and has worked at the same site for eight years, reiterates this.

Karen: "Being a woman and getting a job here wasn't easy. But in the whole country, not just [the mine site] and not only in the mining industry. Employers worry about women who will get pregnant while working for them. Of course, they can't say this out loud because it's illegal. But [the company] is changing things."

Allison: Can you please explain this further?

Karen: "Normally once you give birth, companies get rid of you. I know two women who were fired after giving birth. Of course they… they find other excuses but it's because of that. They would say 'your position is no longer there.' Of course, if they say it's because of pregnancy you can chase them in court. That's why the company was always telling us to tell HR when we are pregnant, so they can chase us out. There was a lady in stores, and they chased her! But with new management the woman got hired back. A lady I know at [another mine site], after she gave birth to her second child, she was chased away."

Allison: But why? Why would a company do this?

Karen: "Because they [the company] are losing money. Women must be paid during maternity. Women get three months maternity. Even government pays you, but the company hires someone new to replace you and they have to keep them when you come back. They see it as a 'losing'. I don't know. The company feels more safe with men."

Karen spoke very highly of the current management at the mine company in Rwanda where this research took place, particularly in supporting and hiring women across company positions, including underground work. However, her statement reflects how female workers perceive job security associated with childbirth and motherhood. It also shows how mine companies less committed to the promotion of women in mining may perceive women seeking work in mining as more risky than male employees, and as a potentially wasted "investment." In addition, even though this company did strongly support female employees, individual male staff members can hold views and perceptions that do not align with official company narratives or national government agendas, complicating women's access to and success in mine work, as well as their everyday experiences.

Motherhood as an inhibiting factor to women's work was also reported in some downstream production roles, like in mineral transport. Danielle stated that finding women in any mine work is rare. "It is hard for women to do this work. The bosses don't want to hire women because they think they will have periods and will give birth and so the boss doesn't want them." Danielle's statement reveals an imaginary of labouring bodies as mechanical and masculine, bodies whose sole function is to produce labour outputs. These labouring bodies are imagined as void of female anatomy, like childbearing or menstruation, which are interpreted as a weakness or something that will negatively impact outputs and ultimately mineral production. However, in reality women must navigate the work context while facing the real experiences of being a woman and mother. The majority of female respondents in this study were mothers and childbearing is highly valued in broader Rwandan society. When asking respondents about childcare strategies while they worked, most women indicated that younger siblings, neighbours or relatives took care of their children while they worked, much like the opening quote of this chapter shows. In a focus group interview, a respondent recounted the following story:

> *"When I started working here, I was only able to succeed and keep working here because of my sister. I had just given birth to my 4th child and the 3rd child was still very young, a toddler, and the other two were in school. I asked my sister to come*

and help take care of the kids so that I could work. I called her and asked that she come and take care of the kids, which she did. So, I'm thankful to my sister."

However, this balance between work and motherhood was not easy for women. While the company agenda was one of support and promotion of female miners, the corporate environment did not make concessions to motherhood. During fieldwork for this project, the company announced new employee policies which were explained to all staff during pre-shift meetings, lasting 30 minutes to one hour. One of these was the leave policy. While the HR manager explained the new leave policy to all miners, including the category of sick leave, a female miner in the group asked, "can a woman take sick leave if her child is sick?" The HR manager replied "No! If you took leave when your children were sick, when would you work?" She explained that leave can only be taken regarding children when a child dies or for maternity or paternity leave. Elaborating on this she said "…and don't even think about lying about that. The village is small, and most miners are neighbours, we will know if you are lying."

Absenteeism and being late for work due to childcare demands was also an issue many women faced. In a discussion with an HR official, she said "if an employee is late, they are sent home. If it happens five times, they are fired. Women are especially vulnerable to this because of their responsibilities at home." It did happen that women missed work to take care of sick children. At one of the mine sites where I worked with women in mineral processing, a participant invited me to conduct shovelling work with her while she panned minerals because her usual work partner was absent that day. I inquired as to why her work partner was absent and she first told me she was sick. When I probed a little further, she told me that actually her co-worker's child was sick and that is why she missed work that day but had disguised it as her own illness. In follow-up conversation with her and the group team leader (a woman) they told me it was common for women to miss work when their children are sick.

Early childcare development centres (ECD) are a growing trend amongst mining companies in Rwanda. Companies create day care centres for children aged four years and younger, as part of efforts to enhance community relationships. While the mining

company was in the process of sponsoring early childcare development centres, they were in fact inaccessible to female mining staff and were primarily used by families in the community. In an interview, a female miner who had a 3-year-old son, told me she had signed up for the ECD but was still waiting to hear back six months later. Other respondents explained that the centres were too far from their homes to be feasible and as a result they relied on family for childcare support.

The presence of children (and babies) accompanying their mothers to work at Central African artisanal mines is an important consideration within women's everyday lives. As discussed in the introduction, due to traceability requirements in "conflict-free" sourcing of 3T's from Central Africa, children are not permitted in mine sites in Rwanda or in DRC, to prevent instances of child labour in mining. If children (including babies) are found at mine sites, the site can lose its validation status as "conflict-free," and the site can be shut down. As a result, babies or older children never accompany their mothers to the mines in Rwanda. This is largely attributable to national formalisation of the Rwandan mining sector, led by the government, which enforces legal requirements through strict oversight measures and a broader societal emphasis on respect for the rule of law. As discussed above, women address this primarily through individual strategies of support through kinship networks. This stands in direct contrast to Congolese mines where, as I have discussed elsewhere, it is common for women miners to bring their babies with them to work at the mines, largely because childcare is neither available nor affordable (Furniss 2022). I observed in 2019 that women respond individually and collectively to these responsibilities. Sometimes, women would run away or hide from state authorities when working with babies, while in other instances, women worked in collaborative groups to create a form of childcare amongst themselves at the mine site (Furniss 2022). Although state authorities in DRC also enforce the prohibition of children (including breastfeeding babies), the law is less strictly enforced than in Rwanda, which means women can continue working in the mines with their babies.

Motherhood is intertwined in the everyday work lives of women in this study. It affects their fears and perceptions of job security, it directly impacts their incomes (or loss of incomes) and affects how others (authorities, managers, companies and colleagues)

perceive their contributions. How women navigate and face barriers associated with motherhood is an important consideration in their everyday work context. The categories of "mother" and "miner" are largely inseparable yet enforced as if they were so. Due to motherhood responsibilities, women are vulnerable to dismissal, absenteeism and decreased economic benefits. Here, from the point of view of the company, women emerge as a "lost investment," believed to present a potential financial loss to private companies because the overlap between the roles of "mothers" and "miners" might lead to absenteeism or reduced labour outputs. As Karen stated, "employers worry about women who will get pregnant while working for them." Women are seen as a waste of company resources, unable to deliver on the grounds that their maternal roles inhibit their work roles. Here the disposability of female mine workers becomes clear: they are seen as "wasted investments" and as a result, labourers who are easily disposed of.

Sponges of Mine Toxicity: Gendered Health Impacts to Mine Work

A strong theme of gendered exposure to toxicity arose in the fieldwork, although it had not been a primary focus of the work. After merely an hour and a half in a tunnel when the ventilation system was not working, I complained to a male colleague about not feeling well. He said "yeah that's why all these miners die when they are 35. The racist whites don't care about us…back in the day if one person dies in the mine, they say – well it's only one person. That's how it is in Africa." I frequently felt physically unwell while conducting participant observation in underground and outside tunnels. I wrote in my fieldnotes on several different occasions about this.

> *There was another bobcat there, which was actually just idling. The fumes were SO INTENSE, I actually started to feel sick and like I couldn't breathe.… Even now as I write these fieldnotes my lungs are heavy and I didn't feel well after getting out of the tunnel.*
>
> Fieldnote, 16 February 2023, Kigali.

> *As we spoke I started to feel very unwell and ill. Even [research assistant] and [participant] had put on masks. I had my mask on and it seemed to help but I felt*

really unwell. I couldn't focus to keep talking to him and interview him. I had to sit at a bench a little off to the side where there was fresh air.

Fieldnote, 21 March 2023, Kigali.

I shared with participants when I was not feeling well, not only because it negatively affected my ability to interview people, but also because participant observation is an embodied practice with conversation as method, which is not unidirectional but exchange-based. My own experience of illness during fieldwork at mine sites does not prove that these mines were toxic or harmful to human health – critics might simply say that I was unused to the context. However, my own experience of negative health effects became the foundation for conversations with participants about health and toxicity at the mine sites. Sharing how I was feeling unexpectedly fostered an intersubjective openness amongst participants, male and female, around negative health effects they experienced. Through these conversations, I quickly realised that women faced significant adverse and distinctly gendered negative health effects. These adverse health effects were different based on the mineral being extracted and ranged from headache, dizziness and troubles breathing to kidney problems, vaginal infections and unusual menstrual cycles – all due to mine work.

"Breathing problems" were the prominent adverse health effect women raised as an issue in the coltan and tin mines. A female respondent who was pregnant said of her work in the tunnel "something wasn't right about the air." She no longer worked underground because she was pregnant and was now instructed to conduct processing work outside the tunnel. On a separate occasion, a group of five women joked with me, asking if I was brave enough to go into the tunnel. I said I did not like the tunnels because I find it hard to breathe properly. "Oh yes! This happens to me too. I have chest problems when I go in there" a respondent stated. The four other women erupted in agreement saying, "the air in the tunnel is not good." Another respondent said "I get headaches from the bobcat in the tunnel. Sometimes when I cough or blow my nose, black comes out."

A company employee engaged in health and safety work at the mine told me that the biggest health problem facing workers is "TB, pneumonia or some kind of lung condition."

Over the course of fieldwork this "lung condition" was never defined by mine company staff but miners called it silicosis. Karen shared the following story with me when we discussed adverse health effects in mining.

> *"I know men with a 'breathing sickness.' One day I was in the company truck going to the site and we passed a man walking slow. I went to work for two hours and when I came out… he was still walking, and it was only like 500 metres. Silicosis. He couldn't walk properly. That was my first time seeing this. His sickness was silicosis, and he wasn't at the age of pension. He was a subcontractor, and they gave him small work without too much energy. Simple work. That's what that disease does, it makes walking hard. It can take you 3-4 hours to reach what should take you 30 minutes. You walk very very slowly. I was very surprised, I didn't know."*

In an interview with a male miner in his 60's who worked in the mines for more than 45 years, he said laughing "lung problems are normal. Sometimes when I breathe it's not good, I'm not breathing well….80% of the people who are my age who worked in the mines are dead. Some of them died from lung problems." A female underground miner I interviewed said "I heard drilling work causes a sickness." When I asked what kind of sickness she said, "I don't know but something with breathing." Another respondent said, "there is a sickness because of the dust." Even in Congolese artisanal mines, women complained of breathing problems. Pascale said, "sometimes if the dust is too much, it can bother me."

Adverse health effects associated with mine dust were also reported at the export houses in Rwanda. Jessica explained this as follows:

> *"I would get a cough and many colds. I got a lot of headaches. There was also a lot of noise which would give me headache. They would give us yogurt and then switched to milk to help with the dust, but it didn't help. Even people who take it still have cough and feel dizzy, especially in the morning. You become so tired you can't make the full day of work. But eventually you get used to the dust. Although many*

people get very sick. After working there more than five years you see people with very bad cough, they may be in hospital. Many have TB and get very dizzy."

"Breathing problems" in mine work was caused by a combination of two factors. One is the chronic exposure to exhaust fumes in underground tunnels when small machinery is being used, whether ventilation systems are working or not. The second is inhaling silica dust from mining activities, causing a long-term lung disease known as silicosis. Crystalline silica, what is commonly referred to as silica dust, is a prevalent and naturally occurring mineral that causes damage to the lungs when inhaled (Rees and Murray 2020). Through mining activities, such as drilling and crushing, crystalline silica is dislodged in a fine powder form and airborne, invisible to the naked eye. Chronic exposure and inhalation cause lesions to the lungs which foster scarring or fibrosis, leading to silicosis, a fatal lung disease (Rees and Murray 2020). Symptoms, including shortness of breath, a persistent cough and weight-loss, do not appear immediately but only after long-term exposure and as the condition worsens. Silicosis is a chronic disease and significantly increases the risk of other pulmonary diseases, such as tuberculosis (TB) and lung cancer (McCulloch 2012).

Silicosis exists globally and is one of the oldest known occupational health risks. It has been well studied in the South African context where there is a high number of documented cases and especially high concentrations of silica dust in underground mining operations (McCulloch 2012, 5-7). However, the artisanal mining context, which uses less heavy machinery, is different from industrial mine operations like those studied in South Africa, and the occupational health risks vary between these contexts. Scholars have noted that while artisanal and small-scale mining is on the rise in low-income countries, especially in Africa, there is little known about silica exposure in ASM in developing countries (Rees and Murray 2020, 476). While clearly understudied, the accounts and oral history of miners discussed here show that it is prevalent, known and discussed amongst miners and in mining communities, although with a significant amount of ambiguity.

Tungsten extraction presented different adverse health effects, according to those I interviewed. Tungsten extraction in the present study in Rwanda occurs with the use of blasting in tunnels and the use of bobcats and locomotives to remove excavated minerals from tunnels, followed by initial panning and separation outside the tunnel entrance. In the hand panning process for initial mineral separation, a separation pool is used. It is a one meter by one meter square, sitting below ground level and filled with water. To conduct hand panning, a miner sits on the ground with their feet in the pool of water. Using a metal pan, periodically filled with a shovel full of minerals by another miner, the miner makes a circular motion to wash and separate minerals from waste, as depicted in Image Ten below. When water is poured into the pit it immediately turns black with a thick silver film across the surface. A miner's hands as well as the lower body become wet through the panning work. Although some miners wear gloves, they are not waterproof, and, once wet provide little protection. Coveralls are worn by all miners, since the black soot from tungsten extraction covers each miner from head-to-toe by the end of the day, particularly those who work in the underground tunnels. At the end of each workday, male miners would strip to their underwear and using the same black panning water or sometimes collected rainwater, take a shower in the open air. When discussing this with female miners one woman proclaimed, "We could never do that! The water is too dirty!" Although women too were covered in black soot and mineral debris, for reasons of privacy, they waited until they got home to wash the mineral debris from their clothes and bodies.

Image 10: Women working at a tungsten mine.

In the tungsten mine in Rwanda, women experienced negative health affects relating to their reproductive systems. While working in tungsten processing work with three female miners, I asked them about any adverse health effects they experience and they responded, "You can't understand!" Through follow-up conversation they all described headaches, chest pain, lower back pain, what they classified as "kidney problems" and said they get "two periods per month." Later Emily explained this menstrual phenomenon in more detail. She explained that her period comes "sooner than it should."

> *"I get my period on the 5th of the month and again on the 20th… and this happens every month. I noticed it comes more than it should. I thought I had a sickness but then we had a group meeting as the women's association and some other women brought it up. Then I realised it was from the nature of my work. It seems to happen to women who mostly do the panning."*

She told me her period lasts 3-4 days and getting her period twice per month never happened before she started working in the mine. She further described chest and back pain, as well as problems with her kidneys. She had gone to the medical clinic in her village because of how bad her lower back pain was. There she consulted with a nurse

who took blood samples and did a urine test. The nurse told her she has “a problem with her kidney and must drink a lot of water.” Emily does not drink alcohol and said the nurse did not tell her the name of the “sickness” affecting her kidneys. She also described getting vaginal infections regularly, which she attributed to the dirty toilets at the mine site. She said “I stopped going pee at work. I just hold it. I would rather go pee at home or in the bush on the walk to and from work.” Both factors would likely contribute to bladder and urinary tract infections and literature has shown that chronic exposure to tungsten impairs kidney function and can contribute to the development of chronic kidney disease (Grant et al. 2022).

A health care worker based at the mine site in Rwanda also reported the biggest health challenges facing women as irregularities in women’s menstrual cycles, chest and back pain, kidney problems and vaginal infections due to mine work. All mine sites keep sanitary napkins for female workers who get their period unexpectedly at work (although they are not always in stock). She is charged with distributing those, which led her to realise that female miners were experiencing irregular menstrual cycles. “Women come to the clinic more than once per month asking me for pads. That’s how I knew.” She was adamant that this was not due to a miscarriage or women taking sanitary napkins home because it happened regularly to many different female miners. Moreover, she knew that some of these miners took birth control. She further explained that at a recent meeting for all female workers with the company women brought up the issue of irregular menstruation. She recounted that “some women said it was because of taking birth control that women got two periods per month. But I don’t believe that. It’s from the physical work and stress.” She attributed women’s lower back pain to uncomfortable and awkward sitting positions women work in while conducting panning work and said “women have to sit in dirty mine water when they work. This causes vaginal infections. This can make its way to the back. Women get wet from sitting and panning and this causes infections.”

In a focus group interview a respondent said, “since you [Allison] did panning, you know how much it hurts your back. I get problems with my period because of the panning work. The dates of my period change, the bleeding intensity increases, and I get periods more

often." Another respondent said "I experience very bad back pain and problems with my period. My periods are longer than normal, instead of 3-4 days, they can even reach two weeks. I went to the *Centre de Santé* [health clinic] and they gave me pills for this and I have to pay extra attention to hygiene and be prepared with pads. But each body is different, and this doesn't happen to everyone."

Women largely suffered in silence, not sharing their health concerns or experiences with each other. It was only through a group meeting that these challenges were discussed openly showing collective experiences, long after women had been experiencing them. Women did seek medical attention but did not receive detailed information about their "kidney problems," including potential causes or treatment. Many respondents internalised the pain they experience at work by blaming themselves for adverse health effects for example, when they attributed irregularities in their menstrual cycles to "taking birth control." These problems were also clearly articulated to external factors, attributed "to the job." From my data, the negative reproductive health risks were unique to the tungsten mine, while respiratory issues occurred across all 3T mines.

Moreover, the long-term effects of tungsten exposure and toxicity from mine work emerges as a form of "slow violence" (Nixon 2011), a deep reaching dimension to exploitation and toxicity that will only become visible in the future. Slow violence emerges through the direct chronic exposure to mine toxicity which could cause negative long-term health problems, such as cancer of the lungs and kidneys and/or future reproductive problems. In connecting the physical body with social worlds, these slow violences could also impact women's futures, lived or imagined, where childbearing is emphasised and a highly valued aspect of women's lives and positions in society. Slow violences also emerge through environmental contamination, like of local water sources due to mine run-off, which could further exacerbate long-term and largely invisible implications to this toxicity. Furthermore, the fact that women only cleaned mine debris off their clothes and bodies once home, citing reasons of privacy, could lead to secondary effects of mineral debris entering women's homes, with the potential for cross-contamination of children and other family members, as well as of food and water sources.

The experiences women shared show the deeply unequal distribution of toxic exposure when considering the pole of production with the pole of consumption in the manufacturing of digital technologies, a point of analysis in the present study. This is an example of what Paul Geissler and Ruth Prince argue are the "[u]neven geographies of pollution and toxic environments" (2020, 3), in which we live and are part of the troubling realities of toxic flows of capitalism and the toxic worlds in which we exist.

The toxic effects of mine work explored here show that women, the catalysts of production, work at great cost to their health and wellbeing. Like men, their bodies become the sponges of mine toxicity, which caused them to have lung and kidney problems, but they also experience negative impacts on their reproductive systems. This translates into a form of embodied violence as negative health effects are experienced in the short and long-term, the full impacts of which remain unknown.

Conclusion

Women's everyday work context reveals several gendered vulnerabilities and barriers to work, with women facing financial extortion, sexual exploitation, exclusion based on motherhood and gendered effects of toxicity in mine work. These vulnerabilities and barriers foster sites of exploitation, disposability and embodied violence. I argue that in analysing these experiences of violence collectively, women experience multiple extractive violences and exposures. Women are exploited financially, capitalised on for individual financial gain by male gatekeepers through a gendered extra-legal taxation. This is a form of material violence situated within "everyday violences," as a mundane and daily occurrence based on gender. Women experience embodied violence through both the threat of and lived experiences of sexual exploitation and harassment associated with their work and chances of maintaining their jobs. These are overt and often distinct violent acts inflicted on the female body with physical and psychological effects. Women are considered a "lost investment" by companies, easily disposed of when they face motherhood responsibilities. Women are "thrown away" after childbirth,

a violent experience of exclusion wrapped in the everyday, rooted in capitalist modes of production that imagine the bodies of mine workers as masculine and mechanical. Women's bodies also become sponges of toxicity in mine work, again fostering an embodied violence and form of disposability. Here the continuum of violence begins to become visible, as women experience negative health effects in the present, while the long-term negative effects are yet unseen. All these manifestations of the use and abuse of women as labourers along an extractive frontier foster extractive violences. Women are exploited in multiple ways by authorities, processes, exposure and those in positions of power. In both Rwanda and DRC the lived realities of poverty exacerbate the vulnerabilities women face, as they often cannot afford basic needs, such as adequate food for their children, despite earning an income from mine work.

The extractive violences explored here are foundational aspects to "extractive logics" (Murrey and Mollett 2023), which continue to perpetuate exploitative practices that maintain the status-quo in extractivism. These logics have localised consequences, largely shaping the present life worlds of women and their future livelihoods. The full impact of these violences remains unknown but they have the potential for physical and social implications in relation to women's futures. The embodied violences experienced by women in the study are a lived experience of extractive logics that devalue human life and labour, and which emphasise the gendered experiences and disposability of those living and working along extractive frontiers.

The experiences women face further nuance and add gendered considerations to longstanding regional concepts that intersect in this chapter. Notably the gendered dimensions to *"la débrouillardise"* demonstrate how the national informal policy in the DRC for individuals to fend-for-themselves affects women differently. While *"la débrouillardise"* is widely accepted, women were negatively affected as easy targets for financial extortion under the banner of *"la débrouillardise,"* which they rejected, considering it extortion.

This chapter also highlights intersections between national law and gender, notably how law and legal frameworks in mining have negative gendered implications, which are

largely overlooked. Feminist legal scholarship importantly calls to attention that the law is not gender-neutral or objective, but rather that the law and legal-frameworks are based on male experiences that value male characteristics, creating a legal system that privileges men (Bonthuys and Albertyn 2007, 31). We see this play out in multiple ways through how the vulnerabilities and barriers to work that women face intersect with the law. In Rwanda, we saw that women have legal protections to work after childbirth but may still lose their jobs after giving birth. We also saw in Rwanda that despite a national narrative and agenda that promotes gender equality, women are regularly subjected to sexual harassment and exploitation, notably around forced transactional sex. Despite the intention of law as a tool to uphold collective societal values, rule and order, women remain largely unprotected by it. Similarly, in DRC, male gatekeeping requiring a "fee to work" created a significant economic barrier for women that they resented and attempted to resist. In these examples, women have the full legal right work and protections but the gendered implications of how the law is implemented (as well as drafted) marginalises women and does not address their vulnerabilities or gendered barriers to work.

In this chapter we begin to see how the narratives of both men and women emerges and impacts women, a key aspect of the overarching theoretical framework of this dissertation. Men's narratives that "women are not allowed in the mines" enforces the masculinity of mine spaces and work associated with men's self-identity and manhood as providers, mine workers and community authorities. This narrative directly impacts women's identity as mine workers and beneficiaries of extractive capital, as we saw they are excluded (deemed "not allowed") and face extortionary practices. This narrative justifies women's exclusion from mine work and spaces. Corporate narratives are also in tension with reality. Despite a strong emphasis on the promotion of women in mining, in practice, corporate narratives seek to separate women's dual positionality, as miners and mothers, even when some concessions (such as ECD's) are made. The company disallowed any concessions which would assist women in their everyday work lives when those concessions had a negative impact on production targets and labour outputs. In women's narratives they articulate internal and external factors to justify challenges, hardship and gendered dimensions to their work. "It's because of birth control" or "it's

part of the job," show how meaning is generated for the vulnerabilities and challenges women face.

Importantly this chapter also begins to show how tensions arise within the work regime, a theme that re-emerges throughout this dissertation. The experiences of women are not uniform but fluid and unique. While some women face a gendered fee, the elderly did not. While some women lost their jobs or quit because of sexual exploitation, others could successfully navigate these challenges. While some women got "two periods a month," this adverse health effect was not universal. While some women managed to keep working despite childbirth, others did not. These tensions are important in understanding the everyday working context for women and how they respond and navigate these tensions. This also helps explain why the gendered dimensions remain invisibilised. Within the broader context of this dissertation, this chapter sheds light on the gendered subjectivities and gendered dimensions to extractivism and the broader 3T supply chain, focusing on how women experience the everyday in different ways from their male counterparts, in ways that are also violent and embodied. Building on this, the next chapter will analyse how women respond to and understand gendered dimensions to their work and lives in extractivism.

CHAPTER SIX: REFRAMING WOMEN'S WORK: FRICTIONS IN GENDERED DIVISIONS OF LABOUR AND DOMINANT NARRATIVES

The working context for women in both Rwanda and DRC is one of significant gendered divisions of labour, most pronounced amongst mine workers at the first and second nodes of the supply chain. Most frequently these divisions are premised on a perceived lack of physical strength and on cultural beliefs. Women were prohibited from conducting shovelling work (in sleuthing for mineral separation) outside mine tunnels, as well as from the physical excavation of minerals from underground tunnels or from going underground at all. These prohibitions align with much of the regional literature on the topic (Buss et al. 2017; Buss and Rutherford 2020). However, these generalised prohibitions on women's labour also are complicated by inconsistency across mine sites and country contexts as to what work was considered "men's work" and "too physical for women." Gendered exclusions changed from site to site. For example, there were instances in Rwanda where many women conducted a plethora of tasks in underground tunnels working as mining engineers, supervisors, in loading bags of minerals and in transport of minerals out of the tunnels. In other Rwandan sites, women only conducted "cleaning" work, literally sweeping mine tunnels, or pushing wheelbarrows, and were prohibited from conducting other tasks based on ideas about gender. In DRC mines, women were not allowed underground at all. Similarly, shovelling work in all the fieldsites where I worked was most consistently labelled "men's work" and excluded women. However, even within the "male" task of shovelling, there were exceptions where women also worked in sleuthing. Women who conducted this work were usually permitted to do so under special circumstances, such as through agreements with male colleagues. The manifestation of gendered divisions of labour also presented tensions for women, who at times rejected these categories and divisions. For example, while women in general did not work with jack hammers underground, some women reported trying it and wanted to do it. These examples begin to show broad gendered divisions of labour but also differences between mine sites, power dynamics and in gendered ideologies, which affect women's positions in work in localised ways. As I will explore, these divisions are not universal or static, but fluid and shifting, showing just how porous these divisions are, a central element of this chapter.

The inconsistency in gendered exclusions based on perceived strength also changed across the supply chain. Notably, mineral processing work was considered docile enough to be "women's work" at mine sites, with underground excavation work reserved for men. However, in downstream production roles, such as at export houses, processing work was considered "too physical" for women and was reserved for men, pushing women into administrative tasks. Despite mineral processing being the same type of work at mine sites and export houses, it was defined by gendered parameters differently across production roles along the supply chain. While the tasks women could conduct changed along the supply chain, the underlying ideology and outcome remained the same. Notably the reason for women's exclusion was primarily attributed to perceived physical strength; the outcome was that women were blocked from certain work, maintaining certain mine spaces as male enclaves.

Moreover, in DRC there is a strong dominant narrative that all women who work in extractivism are victims of sexual violence and exploitation, associated with broader "conflict-minerals" discourse. Women are very aware of this narrative of victimisation and strongly rejected it, seeking to reframe it by inserting themselves and their own perspectives. In a related experience, women frequently faced negative perceptions from others (colleagues and community members) for working in the mining sector, due to the male dominance of the industry. However, these perceptions change completely in high income earning positions in downstream production roles, where women who achieve both success and affluence in the industry were perceived more positively.

As part of examining the everyday lives of women and how they understand their work in extractivism, this chapter examines how women narrate their presence, success and general work environment in extractivism. It addresses the sub-questions, what gendered divisions of labour emerge? How do women respond to these gendered dimensions of work? How do women frame and narrate their place and participation in extractivism? I show that gendered divisions of labour in mine work are porous and that women narrate their position in mining in a way that rejects victimisation and stereotypes. I argue that this contributes to a slow acceptance and shifting of perceptions of women's work in extractivism. Differences in the types of work women

conduct between mine sites reveal just how arbitrary gendered binaries are, with no consistent inclusion or exclusion of women in mine work. Of note, women working in downstream production roles experienced significantly more societal respect and acceptance in their positions from others and women (themselves) attributed their success and acceptance to a gendered "transformation" into manhood.

The first section of this chapter describes and analyses how and why gendered divisions of labour emerge. The second section discussed the frictions that emerge within these divisions. I then discuss shifting perceptions of women's work in extractivism and how women frame their contributions to the sector. Lastly, this chapter will explore how women insert themselves into dominant narratives in a way that reframes their positions and contributions.

Witches and Weak Women: Gendered Divisions of Labour

In both countries, respondents most frequently reported shovelling work as "men's work," because women did not "have the strength," resulting in frequent exclusion of women from shovelling work. Respondents consistently emphasised this "lack of physical strength," to justify women's exclusion. During an interview in Rwanda the team leader of a group of men who exclusively conduct shovelling work said, "this work is too hard and physical for women." At that site, women never conducted shovelling work, necessary for the early stages of separation of waste material from mineral deposits. In an interview with a female pump attendant at the mine site she told me she had never tried using the shovel nor seen any women there conduct shovelling work. "I have never seen a woman do this work….it requires a lot of strength. I have just never seen a woman do this in all my time working here." When asking a different male team leader why no women worked on his team, he explained "it's physical work. It requires strength which women do not have." He went on to describe the tasks of his team as lifting bags of minerals, connecting water and shovelling, stating "a woman cannot do that." While shovelling work at that site was perceived as "too hard for women," women working in

various tasks in underground tunnels was accepted by employees. A third male team leader said women do not work in shovelling "because it is too hard, it requires a lot of strength, women can only work in the tunnel." From this statement tensions and frictions become visible as inconsistencies emerge, for as I discussed below, in many other cases women were not permitted underground.

In DRC and Rwanda, the reasoning for women's prohibition on shovelling emphasised physical strength but in Rwanda, restrictions on women's labour also involved notions of capacity. Respondents always used one of two Kinyarwanda words when describing women's lack of strength. Either *imbaraga,* meaning strength, or *ubushobozi* meaning capacity. The interchangeability of the words *imbaraga* and *ubushobozi* begins to show how labourers understand and articulate notions of strength, which goes beyond the physical body, in the production of labour outputs. The word *imbaraga,* meaning strength, places an emphasis on the physical and muscular body in considering the demands of extractive work. When participants used the word *imbaraga* in a gendered way, applied to the female body as they have done here, it evokes a biological imaginary of the physicality of those sexed female as having a weaker body. On the other hand, the word *ubushobozi,* meaning capacity, is a broader evocation of ability, that goes beyond the physical body to also include psychological and social considerations. Thomas Cousins conceptualises the notion of capacity amongst female timber plantation workers in South Africa through the isiZulu word *amandla*, as the ability to take action and negotiate daily life in the wake of violence, displacement and disease (2023). For Cousins, *amandla* "emerges as that capacity to navigate and negotiate distinct topologies of life and death" (2023, 8), showing that capacity goes beyond the physical. In the present study, participants articulated the prohibition of women's work in relation to the female body (perceived as weak) and to broader gendered navigation styles through *ubushobozi*, capacity.

In addition to shovelling work, similar exclusions existed in regard to underground mine work, however there were significant differences for women working underground between DRC and Rwanda. In the Congolese context, there was a stronger prohibition on women entering underground tunnels. Women were colloquially called *"les femmes creuseurs"* (women diggers), but in describing themselves they say they are "not really

diggers" because they do not go underground, revealing how rare it is for a woman to go underground. This is due to both the belief that women do not possess the physical strength to do so and because women are considered bad luck if they do (or if they even come near tunnels). This echoes existing literature on women in Congolese mines, which has made similar observations. Buss et al. have noted a widespread belief amongst male and female mine workers in DRC that women are physically unable to do certain work, particularly extraction tasks, excluding them from said tasks (2017, 28). Women have also been seen as "polluting" to mines and mineral production, particularly menstruating women, who are then prohibited from entering underground mines (2017, 30). Other scholars have reported broader instances where women are not allowed in mine sites at all in fear that they will make minerals disappear (Hayes and Perks 2012).

A perceived lack of physical strength and the belief that women bring bad luck were also observed in the present study in DRC. One male respondent told me, "Women are scared to go down, women lack the strength to go down." Beyond justifications around lacking physicality, too much metaphysical strength was also cited. In an interview with a male pit owner, he recounted a story that solidified his belief that women bring bad luck if they even come near an underground tunnel. He recounted that once he was talking with a woman at the entrance of a pit and after finishing his conversation with her, he went underground. That day they did not get any production, and he blamed the woman's presence for this. In reference to this experience, he said *"c'est les femmes sorcières!"* translated as "it's [because of] those female witches!" He believed firmly that women make minerals disappear. During his recounting of this story all the other male diggers around us agreed that women should stay away from their work but, interestingly, they said women should have their own pits. While at other sites women were allowed near the entrance of tunnels, I never observed a woman in an underground tunnel. While this example is indicative of the multiple factors that affect women's participation in mine work, it also falls within a widespread societal presence of witchcraft accusations and broader beliefs in witchcraft practices (De Boeck 2016; De Boeck and Plissart 2014).

Unlike in Congolese artisanal mines, women could enter underground mining tunnels in Rwanda at the fieldsites of this study. This is counter to literature on the topic from

Rwanda, which has shown that women are frequently prohibited from entering mine tunnels due to cultural beliefs (Buss et al. 2017; Nsanzimana, Nkundibiza, and Mwambarangwe 2022). However, the acceptance of women working underground is relatively recent and largely due to formalisation of the mining industry in Rwanda, with private companies and government strongly promoting women's involvement in mining, including underground. As discussed in the Introduction Chapter, the sector seeks 30% participation of women. At the time of fieldwork, the company reported 11.7% of the workforce as female across all mines and jobs. An increase in women's participation in mine work, including underground work, in Rwanda over the past five years was widely reported by respondents. Karen, who worked for eight years at the same mine site and held a technical position, reiterated the effects of changes in management on women's participation in mining: "In 2017 I was the only woman underground. In 2021 when [manager] came, women increased. There were only 38 women in [mine site] in 2021. I know this because of International Women's Day… in 2021 we only gave out 38 kitenge to women workers, women were only total 38. This year's Women's Day we gave out 190 kitenge."[31]

The increase in women's participation in underground mine work was largely attributed to mine site leadership and ownership, however this did not fully eliminate gendered divisions of labour, nor address how divisions continue to exist. During an interview, a senior member of a subcontracted company, told me, "Women only started working underground here since 2020 when [the company] took over. Before that the mine was owned by South Africans who didn't allow women to enter in fear of sexual assault." Over the course of fieldwork other respondents also specified that previous "South African managers" did not allow women underground, out of concern for sexualised assault or violence. That decision by previous South Africa management is informed by the high rates of sexualised violence including rape and femicide of female underground mine workers in South Africa. These incidents of violence and even murder occurred while women were on-the-job working underground in industrial mines, a further reflection of

[31] A kitenge is a traditional piece of fabric commonly worn by women in the region.

epidemic levels of gendered based violence in South Africa (Benya 2017).[32] Of course sexual and gender-based violence (SGBV) is not only a South African problem, in general and in relation to mining: studies show that where there is mining there is widespread violence against women in both the domestic and work spheres (Mishra, Sravan, and Mishra 2024). Recalling that Rwanda does not have large-scale mines and that manifestations of SGBV have been reported in regard to forced transactional sex (Munir 2022), the decision to prohibit women from going underground reveals a gendered division of labour based on male perceptions of women's physical safety associated with the threat of sexualised violence by male colleagues. The imposition of one national context onto another created a gendered division of labour not reflective of the localised context.

Nevertheless, the policy to exclude women from underground tunnels was a decision taken by high-level company managers, such as General Managers (who were South African), but was implemented by mid-level Rwandan managers, such as supervisors and superintendents. While South African managers excluded women from underground work in fear of sexualised assault, Rwandan managers implemented women's exclusion based on differing gendered guises, blending it with discourse of broader gendered protectionism and women's "lack of strength." A female miner explained in an interview how women were not allowed in tunnels "before" in order to "protect them."

> **Respondent:** Mine site authorities didn't trust them [women] and thought that if they went into the tunnel they will be abused, but now people see it is okay.
>
> **Allison:** What authorities?
>
> **Respondent:** Subcontractor bosses. They do not let women out of their sight to protect them. But that was not the only reason people use to think women couldn't

[32] For clarification, I am specifically referring to instances of GBV against female underground mine workers, while they are working underground. I am not referring to instances of GBV in mine communities or broader instances of GBV as explored in the previous chapter.

> work in the tunnel. People didn't have confidence in them or believe that women had the strength for such physically demanding work.

This quote shows how control over women's work is implemented through various and differing justifications rooted in gendered ideologies. When fused with local perceptions of gendered roles and gendered ideologies, divisions are understood and rationalised in localised ways – so they are not eliminated but new (or renewed) justifications for existing divisions are developed. So while high level managers wanted to "protect" women from sexualised violence, Rwandan managers wanted to "protect" women from jobs requiring (perceived) masculine strength. During this study, women were increasingly going underground in Rwanda; however, their full participation was still limited by gendered ideologies, mostly rooted in perceptions of physical strength, which remain despite a shift away from discourse that women require protection from sexual violence in mine work. In Rwanda we see how gendered divisions of labour were implemented through cultural taboos, gender norms and perceptions of physicality, a distinct form of protectionism. This is further and best demonstrated through the work of "cleaning" mine tunnels, a common job reported to me as "women's work."

On International Women's Day, March 8th, 2023, I attended a ceremony hosted by the mining company in celebration of women and female employees. During opening speeches, the mine site manager asked the group of employees (at least 150 people), "what work can a woman do at the mine?" to which a member of the group answered "cleaning!" "Cleaning" work was exclusively conducted by women and consists of using a broom made of grass to sweep the tunnel floor of excess minerals that accidently fell during transportation out of the tunnel, and to keep gutters clear so water can flow out of the tunnels. I frequently observed women conducting this kind of work, writing in my fieldnotes:

> *As we walked in the tunnel I passed 12 women, all sweeping the trolley tracks or using the shovel to clean the trolly tracks.*
>
> Fieldnote, 16 February 2023, Kigali.

When discussing women's roles in the underground tunnels, "cleaning" was always the first job described to me as "what women do," because they were "not strong enough" for other underground work. My observations aligned, as I only ever saw women conduct cleaning work. The ideology that women are not strong enough for other work was held by some women, too. In an interview, a woman miner told me the only mine work she conducts is cleaning work outside the tunnel and no other mine work because "women do not have the strength." In addition to cleaning, women were allocated the work of folding and organising bags used to carry minerals out of tunnels. These bags are reused on a rotational basis. Multiple female respondents reported that they conducted the work of bag folding as part of their daily tasks. In addition, while working a morning shift, I witnessed a male team leader chastise a young female worker for not folding the bags quickly enough, while male colleagues sat nearby, not assisting, a clear allocation of the work as strictly women's work. These docile tasks allocated to women mine workers reveals the gendered nature of their work regime and how gendered divisions of labour persist and manifest.

As these examples show, women's labour (as in what work they could conduct and the spaces they could occupy) is controlled and limited based on protectionist discourse, which also holds negative financial implications.

In Rwanda, subcontracted employees who conduct sleuthing work make 300 RWF more per kg of production than any other labourer. Team leaders get a bonus of 100 RWF per kg of their team's production per day. Sub-team leaders earn an extra 50 RWF per kg for the total production of their team at the end of the month. Wages within subcontracted companies were egalitarian in the sense that if a labourer works in the human-chain or folds bags, their daily wage will be the same, based on production not task. However, "speciality" positions such as shovelling or positions of leadership were paid more. Here, there were noticeably fewer women present, largely prevented from working in these positions due to gendered divisions of labour. In another example, a jack hammer operator will earn a monthly salary of 150,000 RWF ($100 USD) and must be an employee of the company, earning a salary much higher than a subcontracted worker. Recall that on average most subcontracted employees earn $30-$60 per month. With a significantly

smaller number of women in positions of leadership and women blocked from "speciality" jobs, like shovelling or using the jack hammer, due to gendered ideologies, women earned less overall because they had less access to higher income earning positions.

The exclusion of women from certain work can not only be attributed to men and/or management. Some female respondents did express doubt about their own propensity to do physically demanding labour associated with mine work, stating that they "lacked the strength." In this way, gendered ideologies, rooted in patriarchal scripts, were in some cases internalised by women. For example, during an afternoon shift a young female worker folded empty carrying bags to send them further down the tunnel to be refilled. She complained to her female team leader, saying she did not want to fold bags but wanted to go down the pit. The team leader replied by rhetorically reasserting the gender norm: "How can you expect men to fold bags and you go down the pit?" This example shows how women's internalisation (in this case the female team leader) of gendered labour regimes also has a controlling effect on women's work and roles. However, this example also shows that some women were outspoken against the gendered labour regime in which they found themselves. It is these rejections and frictions of gendered divisions of labour to which I now turn.

Frictions, Fluidity and Rejections in Gendered Divisions of Labour

Despite these distinct gendered divisions of labour, frictions also emerged with women challenging these divisions and outright rejecting them. A significant portion of participants were outspoken in seeking to cross gendered divisions, rejecting ideologies that restricted their work. This results in contradictions and exceptions to the gender regime of mining that is generally taken for granted.

There were instances of women conducting shovelling work, a rather unusual occurrence. Kim, in Rwanda, conducted shovelling work in sleuthing processes, in a

team with four men, the only women to do this work at the site. She is 27 years old and has worked in the mine for two years as a subcontractor. “Working with the shovel is my talent!” she exclaimed. She recounted that when she started at the mine, she was working in the tunnel putting *umuchanga* (waste minerals) in the wheelbarrow and transporting it outside the tunnel. In her working context, miners work in teams of 5-11 people and each team is responsible for their own production and as such profits. One day she was asked to work with the sleuthing team primarily in administration tasks, to record production, collect payment from the company and pay each subcontractor. That day the group got extremely high production and as a result, a much higher payment than usual. She told me, “Everyone in the group said it was because of me, because I brought good luck. They made me stay on the team and I started also working with the shovel. They see me as a leader in the group now.” She said, “Everyone thinks I am good at the sleuthing work, so I just keep doing it. Everyone who works in the tunnel thinks sleuthing is hard work but it’s my talent.” She said she enjoys the work, and she is “good at seeing cassiterite [tin],” meaning identifying the high value mineral from waste with the naked eye. If a manager ever asks her to go work in the tunnels, her team complains because she is considered so valuable to the team. “The other teams think it’s not normal that a woman can like the shovel so much and do it well, like a man or even better. They think I am someone extraordinary.” She explained that she learned from watching men do the shovelling work and she reported earning 78,000 RWF ($60 USD) per month. This example stands in contrast to literature which has emphasised women in mining typically as a symbol of “bad luck,” demonstrating how localised experiences can vary. Kim had proven herself to her male colleagues who control access to certain work. Her male colleagues had unique and positive views of her contributions and “talent,” which was interpreted as a form of good luck charm. It is precisely these frictions and tensions amongst women’s experiences which I seek to highlight. This example shows how arbitrary gendered ideologies surrounding perceptions of strength are, since, as this example shows, they can completely change in an instant. In returning to *imbaraga* and the notion of physical strength, we again see how it is *perception* and *interpretation* of strength based on imaginaries of gender and sexed bodies which determines restrictions on women’s labour. It also reflects the control men have in determining what women can or cannot do in mine work, rather than anything to do with women’s actual strength.

In DRC I also saw women conducting shovelling work. Rosalie, who is 30 years old, worked with men in shovelling. She told me men "permit" her to do this work because she has been working in the mine for five years and has more experience than other women here. She also learned from watching men do the work. She explained that she has an agreement with men who "allow" her to shovel with them and then they give her a small portion of minerals at the end of the day for her labour contributions. She will take these high value minerals home to refine and resell, fostering a system where she is paid in production, not in cash. She also cooks for the men in secret (other women do not know about this), which further motivates them to increase her portion of production. In contrast, other women at the site who do not conduct shovelling work will have to buy *mchanga* (waste minerals) from diggers, which is production with lower quality and lower concentrations of minerals that can be refined and resold. So, her work in shovelling allows her to have access to higher quality minerals, making her eventual profits higher than other women. She waits each day until late in the evening to collect her portion of the production. By being granted special permission to engage in shovelling work, Rosalie has access to higher quality mineral production and subsequently higher profits.

While these two women were exceptions and had special permissions and relationships with male colleagues to conduct shovelling work, at other mine sites it was the norm for women to conduct shovelling work as part of their job. At the tungsten mine in Rwanda, women were frequently found shovelling and using the shovel to assist in mineral separation. There was no gender division of labour in the processing work. When I discussed this with women, they said no one at the site had a problem with them working with the shovel; they were often confused why I would even ask about their work with the shovel as something exceptional, as it was so normalised for them to do this work alongside men. The mine site management also highly promoted women in all mine tasks and gendered ideologies were less exclusionary in the workplace and surrounding community. Again, this reiterates the localised nature of gendered divisions of labour, which change and take differing forms at different mine sites. These variations again show just how arbitrary gendered divisions of labour are.

A further contradiction of how miners themselves perceive these gendered divisions of labour occurred at the International Women's Day ceremony, as mentioned above, that took place at a mine site. When the mine manager asked the group of over 150 employees "what work can a woman do at the mine?" A male miner yelled out "work with the jackhammer!" to which the manager responded with genuine curiosity "is it possible?" and collectively miners responded "yes!" The jackhammer is used at the end of the mine tunnel in the physical excavation of minerals, which are then loaded in wheelbarrows or small locomotives and transported out of the tunnel. Miners point the jackhammer either up or down to loosen slabs of rock from all areas at the end of the tunnel. Use of the jackhammer was often considered by respondents as too physically demanding for women. In an interview with a male mine superintendent, he explained to me that women could not use the jackhammer or shovel because the work was too physically demanding for women, but then added "…it's an old mentality, we know women aren't weak, we know they have strength, but they can't do that job."

Use of the jackhammer was narrated by women in contradiction to its classification as "men's work," as many female respondents reported having tried it. Gloria told me she had tried it and described it as being "very heavy." She explained, "I could do the down jackhammering but had trouble lifting it. It was too heavy. I don't want to do that." She was not the only respondent interested and curious in the task. Another respondent told me, "When I saw men working with the jackhammer, I was curious to know if I had the strength for the jackhammer, so I tried it. It was too heavy even to lift, so I knew I couldn't do that work." Sarah told me "I tried the jackhammer twice, for about 20 minutes, but found it very difficult and uncomfortable." During fieldwork I was informed about a sign-up sheet that had been distributed by the company to female employees for those interested to be trained on the jackhammer.

However not all women shared the interest in working with the jackhammer. Josephine, told me she had never tried the jackhammer and had no interest in doing so because "it is heavy and hard work." She was not the only woman who expressed disinterest in trying the jackhammer. In an in-depth individual interview, a respondent told me she was "too scared" to try it and it "looked too heavy." While some women, like Josephine, had no

interest in using the jackhammer, others had tried it and expressed interest in the work. I tried it and found the work demanding. These tensions also highlight how even amongst miners, there is no collective perception of what roles and work women in mining can occupy. Women were not blocked from trying the jackhammer and many had tried, despite the widespread belief that it was "a man's job." Here we also see women's agency in determining the kind of work they conduct. This reflects a fundamental aspect to feminist ideology, which advocates for women to determine for themselves what kind of work they would like to do or can do, rather than have others prescribe or predetermine these decisions. While a visible gendered division of labour existed at the mine, these examples have shown that these categories are in fact porous and fluid. Women, at times, also have more influence on what work they do and do not do than assumed.

"To Cut the Breast of the Cow": Shifting Perceptions of Women's Work

When Gloria owned her shop in the village in Rwanda before she started working in the mines, male miners would come drink beer there after a day's work. She described this period as when "they did artisanal mining." Recall from Chapter Four that this is a common term used to refer to historic periods with less or no formal mine company ownership and when miners worked more independently. She recounted that male miners would not allow her or any other woman to touch their mine equipment (such as hammers) while having a drink, "in fear that it would bring bad luck." Gloria was not the only one with this experience. Another participant, whose husband worked as an illegal miner, told me "Before it was believed that if the wife of a miner touches the hammer used by the miner during the day, the vein will disappear." Josephine also told me there used to be a generalised belief that women bring bad luck in the mines, but since the company took over this has changed and is no longer the case. Although these beliefs were primarily spoken of in the past tense in Rwanda, largely before formalisation processes occurred and the mining company took over, women also had more recent personal experiences of this. One respondent told me she works in a team of 10-12 people, of which she is the only woman, saying, "My male colleagues will tell me not to go near a

vein or the minerals will disappear." In another interview a respondent shared a similar experience.

> *"It's not the same for all men, some understand, others don't. Some say I shouldn't work a certain vein because women bring bad luck…but most men understand and work with me no problem. They joke with me by going to get a small hammer for me that will correspond with my strength so I can dig with them. Just a few think women bring bad luck."*

As already discussed, there are many regional examples where women are thought to bring bad luck in mining (Buss et al. 2017). However, this was not a universal experience amongst participants in this study. Many women did not report any knowledge of or experience of this type of cultural belief affecting their work or lives. Many simply laughed when I asked about this, as if I was crazy to ask in the first place. Rather, most participants emphasised that "now" their husbands, families, neighbours and communities labelled them "delinquents" for their work in the mine. One respondent explained "now the belief is that the women who work here will become '*ikirara'* [delinquent] because they will have their own means and money and so will cheat on their husbands and leave their husbands. Especially because they work with so many other men." Women always used the Kinyarwanda word *ikirara*, meaning delinquent, when describing this. Many respondents shared similar statements. One respondent said, "In the village people think women working in the mines are delinquents because there are so many men working here, so the women who work here must be delinquents." This echoes the observation by Nsanzimana et al. who note that many people in wider Rwandan communities' view women who work in mining as having disreputable morals (2022, 130).

This articulates a shift in the perception of women who work in mining. Historically they were seen as "bad luck" but now they are seen as "delinquents" – both negative attitudes. However, shifts in perspective are occurring. In an especially strong example of the changes in perceptions of women's work in mining, one respondent said:

"Before, a woman who worked in the mines was considered like 'guca inka amabere' [to *cut the breast of the cow]. People could not understand how women could work with men."*

The Kinyarwanda phrase, *guca inka amabere*, translates as "to cut the breast of the cow." This figure of speech was described to me by multiple native Kinyarwanda speakers as referring to something extremely prohibited, a societal taboo. The cow is an especially respected and symbolic animal in Rwandan culture, a sign of wealth and prestige. Any form of mutilation or damage to a cow is socially and culturally unaccepted. The use of this phrase is especially pertinent because cattle raising, much like mine work, is highly gendered. As in many other African societies, in Rwanda, it is historically taboo for women to tend to cattle. Women were forbidden from conducting cattle raising tasks like taking them out to pasture or taking them to drink water, to milk cows or to open or close cattle compounds (Adekunle 2007, 109). Historic and contemporary societal taboos echo and reproduce each other, with the intention of determining acceptable behaviours amongst women and, by extension, women's roles in society.

This figure of speech also sheds light on the cultural significance and gravity of what it means for a woman to work in mining. A woman working in mining was equated to the loss of something precious; the removal of something vital; to change or damage something sacred; to block the flow of life; to engage in unacceptable behaviour; or to do something completely unacceptable. The phrase, "to cut the breast of the cow," also refers to a female cow and subsequently feminises the prohibition. The phrase places emphasis on the sacredness of milk and milk production associated with nurturing and the flow of life. Cow's milk, and milk more broadly, has a powerful significance in Rwandan culture. Anthropologist Christopher Taylor has explored the symbolism of liquids, especially milk, in Rwandan culture practices and beliefs, where the flow of cow's milk is associated with notions of power, fertility and destiny (1992). Taylor writes that cattle, as an important medium of giving life, "produced precolonial Rwanda's most cherished aliment, milk, and they mediated the transfer of human reproductive potential" (1992, 28) primarily through cultural practices, such as bridewealth ceremonies, the merging of families and broader notions of health and vitality (1992).

Considering how sacred the cow and cow's milk are, the metaphor has powerful symbolism in reference to broader notions of fertility and the "normal" flow and order of life and society. This hyperbole as prohibition refers both to the prohibition of women's presence in mining and a prohibition on changing traditional gender roles, which could alter the male dominance of mine culture or interfere with women's societal duties, in what is expected of women and what their place in society is accepted to be. Given the cultural symbolism and gravity of this metaphor, it is a powerful statement for women miners to say that this taboo is losing power.

Respondents also cited their work in the mines as contributing to difficulty in their marriages. One woman, who was separated from her husband shared, "it is most difficult for women who live with husbands and who work in the mines. Women can have disputes with their husbands about working in the mines. The husband can think the woman can be unfaithful because they work with so many other men. Husbands can't accept that women work here." Another respondent said, "in the village people say that women who work in mining will destroy their family because they work with a lot of men and so they will leave their husbands and destroy their homes." While working an afternoon shift, I overheard two women gossiping about this exact phenomenon. One woman recounted to the other "[name] got a job at [company] and has now left her husband because she has her own money!" Gloria said women in the village create "tension" with her because she is a woman working in mining. She said, "The wives of miners don't like me. They think female miners are lovers to their husbands. I greet them but they don't greet me back. There is tension." Women did not report instances of physical violence or abuse from these situations, rather their descriptions used vague terminology like "tension" and "dispute."

In the Rwandan context cultural beliefs that affect women's work mostly took a contemporary turn from "women bring bad luck in mines," inhibiting or interfering with their work in the mines, to more generalised negative attitudes (labelling women as delinquents) that could and do deter women from mine work. While in some cases there is a prevailing belief that women bring bad luck, as we have seen, this was described by participants as changing. When I asked women how they respond to these perceptions,

most reported ignoring it or making jokes about it in a way that brushed these stereotypes off.

The respondent who had a personal experience of being told by male colleagues not to go near a mineral vein in fear that minerals would disappear explained how she jokes with men in response. With a smile and laugh she said, “They [men] can’t really stop me [from going near the vein] but some of them get mad. I make jokes by bringing them a small piece of cassiterite [tin] and I say ‘look, you’re unblocked.’ This makes them madder because of my disobedience.” Here, her use of the word “unblocked” referred to the reversal of the myth that her presence will make minerals disappear. However, most respondents reported ignoring the perceptions of others. One respondent said, “It’s difficult to respond because people don’t believe you. I don’t respond and just ignore them… or I try to explain if they are willing to listen. Even women in the village think this.” Another respondent said “I just leave people and ignore them. You can’t change people.”

This discussion on how the gendered divisions of labour manifest in Central African artisanal and small-scale mines has shown that categories of work are highly porous and fluid. While women are restricted from certain work, mostly premised on perceptions of women’s physical strength and, for some, prior gendered norms about mining, women also actively move between gendered divisions of labour. Gendered divisions of labour are not rigid. Formalisation processes by mine companies and the government have positively impacted gendered roles by working to dismantle them and largely supporting women’s integration in mining. While prevailing beliefs that women bring back luck in the mines did exist, it was not universal. In the contemporary context, women mostly had experiences of negative attitudes towards their work in mining, affecting their marriages and community perceptions of them. Women also explicitly stated that it is becoming increasingly normalised for women to work in mining.

“It Does Not Happen Here”: Rejecting Victimisation and Reframing International Dominant Narratives

When discussing general challenges specifically affecting women in DRC, many interviewees responded by referring to prevailing discourses of physical violence and sexualised assault. Although I did not ask about instances of sexualised violence or abuses due to the sensitivity and potential re-traumatisation associated with this topic, when I would ask women about general challenges they face in Congolese mines, respondents themselves frequently brought up the topic of sexualised violence and abuse. However, respondents unanimously stated that "it" (meaning rape and sexualised violence) does not happen "here" (meaning at the mine site in DRC). Natalie who entered mining because she "had nothing to do" said "in these sites there is no violence or abuse, just some men who provoke us with jokes!" At a different site, a respondent said, "We don't have those problems of rape here." Mirielle said about sexualised assault and rape "We do not have those difficulties here."

This merits two epistemological and ontological points of reflection. From an epistemological perspective, the fact that women brought up sexualised violence themselves when discussing broad challenges they face is directly attributable to my positionality as an outsider and a result of the international emphasis on Congolese women as victims of sexualised violence in mines. The context of rural eastern DRC is one where it is common for *muzungus* to briefly visit mining communities in their work capacities with humanitarian aid agencies, NGOs, United Nations operations or mining company activities.[33] This has fostered problematic and highly racialised interactions between aid workers (mostly white and foreign) and miners (local black Africans). The regional humanitarian aid economy is founded on a highly problematic "fly-in fly-out" model of aid that is driven top-down and is largely drawn along racial lines.[34] As a result, locals often assume that white foreigners work for the UN peacekeeping mission in DRC or for an NGO. Most of these NGO and humanitarian aid initiatives focus on issues of human rights, conflict related security, internally displaced peoples and food aid. As a result, local communities have grown accustomed to their engagements with white people visiting their communities revolving around those topics and lines of inquiry.

[33] Muzungu is a Kiswahili word for foreigner, commonly used to describe white people.
[34] For a discussion of the implications of the regional humanitarian aid economy see: Büscher 2018.

Researchers have also increasingly engaged in the region as interest in mining and traceability measures, particularly in mineral rich Rubaya in Masisi, has garnered increased research attention over the last decade.[35]

In addition, as discussed in the introduction, the international community's emphasis on "conflict mineral" discourse, which associates all mineral extraction from the region with the financing of non-state armed groups and regional conflict, created a secondary dominant narrative which posits all women in mining (and Congolese women more broadly) are victims of sexual violence and exploitation (Autesserre 2012). These dominant narratives led to extensive mineral traceability measures, including an extensive mine site validation process requiring proof that human rights standards are being upheld. As I have discussed in previous chapters, these traceability measures have been highly critiqued by scholars and have had many negative unintended consequences, including instances of increased violence, with much of the traceability measures in place to appease Euro-American interests (Vogel 2022). Traceability measures pertain to women in certain ways including a ban on the presence of pregnant women and the prohibition of children in the mines, which negatively affects female miners. As a result, the combination of my positionality and the effects of traceability measures (which are the product of dominant narratives) provoked women to speak to issues of sexualised violence in mines, a topic that has also garnered extreme attention since the early 2000's (Rustad, Østby, and Nordås 2016; Peterman, Palermo, and Bredenkamp 2011; J.T. Kelly et al. 2011). Women likely discussed the topic with me because it is a topic deeply embedded in the region and something "white foreigners want to hear about."

Ontologically this phenomenon reflects the extent to which international dominant narratives, which emphasise women's victimhood in the DRC, has trickled down to female miners themselves and how they seek to reframe and insert themselves into this narrative. I (Furniss 2022) and other academics (Bashwira et al. 2014) have argued that this particular dominant narrative has fostered problematic unidimensional portrayals of

[35] For examples of recent studies conducted in Rubaya see: Byemba 2020; Schouten 2019; Furniss 2023.

women in mining – and in the region more broadly – as victims, stripping them of any form of agency. Women who spoke about sexual abuse and sexualised violence unanimously stated, “it does not happen here” or “we do not have those difficulties here,” voicing a strong denial of the issue.

What then does women’s denial of victimisation of sexualised violence mean in the mining context? While this directly counters regional dominant narratives and shows how women are aware of this unidimensional portrayal of their position in mine work, their denial does not mean it never happens. I did not always have close enough relationships with respondents for them to feel comfortable speaking openly with me about this topic, even if they brought it up themselves. It is likely that some respondents have experienced some form of gendered based violence (GBV), whether associated with mine work or not. As discussed in previous chapters, recent studies have highlighted a high presence of intimate partner violence and domestic violence in eastern DRC, along with sexualised violence associated with armed conflict for which the region is known. There are also studies that show increased instances of GBV around mining communities (Maubert et al. 2022; Buss 2018; Meger 2010; Østby 2016; Mishra, Sravan, and Mishra 2024).

My goal here is not to prove whether women have or have not experienced sexualised violence, or any other kind of violence associated with their work in the mines, but rather to understand what their denial of the issue tells us. Were women motivated to deny sexualised violence out of fear that the site might lose its “green” validation status, resulting in closure of the mine and the potential of losing their incomes? Were women keeping the site safe and deflecting violence as happening “somewhere else”? Was it because they know what white people want to hear and what white researchers have asked them in the past? Was the working context a genuinely safe one?

It is also unlikely that there is a complete absence of any kind of violence at mine sites. On one occasion I witnessed a very intoxicated male miner harassing a young girl working in the site, to the point that she ran away when things escalated, and he started to become physically violent. This situation also forced my research assistant and I to leave the mine site that day. Some respondents also shared conflicting information. Natalie,

who said “it does not happen here,” also told me she checks in with her daughter who works in mining to make sure no abuses take place while she is working in the mine. This raises the question of why she checks in with her daughter if she says no abuses take place?

Women’s denial of sexualised violence in the mines simultaneously reflects the over-emphasis by the global community on the regional dominant narrative and women’s desire to insert themselves into that conversation, regardless of whether it happens or not. It shows that women themselves speak on the issue as if reclaiming or asserting their right to be in the mines, stating that the mines are safe in their experiences, rejecting the outside world’s view of women in Congolese artisanal mines as victims. It also reflects women’s desire to keep mines open and accessible for income generation. In addition to women reframing the issue of violence in mines through their own words, women also had distinct ways of narrating their contributions to mine work and overall extractive productivity, explored in the next section.

Women in Leadership: Fostering Order and Organisation

Gloria works as a team leader and has worked for the mining company in Rwanda for four years, three years of which as a team leader. She saw an advertisement at the local government offices that the mining company was hiring, applied and got the job. She is responsible for a small team of seven male miners, who mostly work with the jackhammer to extract minerals, putting aside what they call “nuggets” or larger pieces of high value tin which the team then carries out of the tunnels and sends straight to the company’s on-site processing facilities.

Gloria frequently spoke up during staff meetings, making suggestions and encouraging workers. She always took initiative at work and was quick to solve problems that arose during shifts, directing her team and leading in work. One day, at the start of an afternoon shift as we made our way to the dives (small off shoots from the main mine tunnel) where

her team regularly worked, a ladder was much too short, and we could not get to the bottom of the tunnel where miners were going to use the jackhammer. She quickly found a longer ladder, rushing to bring it over and get us set up. That day two younger miners went to the same dive, while two older miners went to the other. She quickly directed them "No! You must mix! How can we only have groups of older and younger men?" She told me later "Mondays are always chaotic. I can't find peace without order!"

Gloria is 37 years old and has three daughters. She is married to a driver who lives mostly in Kigali. She dropped out of high school after three years. Gloria was born in a nearby village within the same district but moved here to open a shop where she sold rice, cooking oil, soap, beer and other household products. She is the same woman who, in an earlier section of this chapter, described how she was prohibited from touching the hammer of male miners who came to her shop, in fear that she would bring bad luck. She described the time she owned the shop as a period, "before [the company] came, when they did artisanal mining. Many miners would come drink beer after work at my shop." She complained, "Many of them would take credit with me but not pay me back." When the company started operating, she was inspired when "I saw the miners who came to my shop had a fixed salary. I thought 'I can go and work there too and see what it is like to have a fixed salary." She described her work in the beginning as being a flag lady outside of the tunnel (someone who directs mine site traffic), then working with the wheelbarrow and managing logbooks, eventually doing the mining work inside the tunnel. None of her family members had worked in mining and most of her family had been killed during the Genocide, she herself having narrowly escaped a massacre.

Similarly, Josephine expressed order and organisation as a significant part of her perceived contribution as team leader in Rwanda and her success in this position of leadership. As we worked the human-chain together one afternoon, lifting bags of production out of the tunnel, she explained that she was elected by her team to become the team leader. "When I started our team was very disorganised! We were not very good and it was total chaos! I just started directing and organising the team. The team leader was eventually fired and the group asked me to be the new team leader." In discussing

work challenges, she said her biggest challenge is working with people of all different ages and trying to understand them and motivate them.

Women in positions of leadership like this were rare. Both Josephine and Gloria described their organisational skills that addressed "chaos" and brought "order" as what set them apart and facilitated their acceptance and success as women in positions of leadership. The ability to create "order" is an important factor in how women in leadership understood and saw their contributions to the work environment and team success. For both of these women, creating order facilitated an upward mobility in their work. This contributed to less precarious futures, not only through increased wages but also their growing respect and stature. Women's emphasis on the importance of fostering order reflects an aspect of the scholar Patience Mususa's ontology of "trying," which she theorises as an approach used by urban residents in Zambia to "get by" in otherwise precarious life situations (2021). Women's ability to foster order contributed to women's understandings of everyday life in the face of precarity and defiance. Women in more affluent downstream production roles also understood their organisational skills as foundational to their success, however there was an emphasis on women's success as gauged to men and masculine qualities, to which I turn now.

"They call me a man": Women in Downstream Production Roles

Women in downstream production roles, which are also more affluent positions, were more accepted by peers and colleagues, even feared by other women, unlike women miners. Sylvie, a subcontracted company owner, is not afraid to go underground in the tunnels to inspect operations and manage staff. She told me she is the only woman to go underground at her site; she told me that because of this, the other miners "perceive me as a man. They call me a man, like a friend." She explained that the women who work for her only work outside the tunnel in mineral processing. She attributed this to women's greater emphasis on planning for the future, consideration for their children and lower risk-taking propensity. She explained, "the nature of women is that they think more about

their lives and the lives of their children…more than men. A woman will think, what if a rock falls on me? What will happen to my children?" She used the Kinyarwanda word *impungenge* which was translated to me by multiple native Kinyarwanda speakers to mean *very* worried or, more simply, concerned. However, in some contexts it means more than concern or worry, as "having a very big fear of something." In this case, she used it in reference to women's hesitation to go into the tunnels. Regarding her own work as a subcontracted company owner, she cited women's lack of access to capital or investment to get into mine work or to expand their mining businesses as the biggest challenge women face. The perspective of Sylvie also highlights the gendered nature of care. Here women's responsibilities for their children and consideration for their children's wellbeing influenced whether they went underground or not. Sylvie's statement reflects an unequal responsibility of care between parents, since her statement implies that no one would be left to take care of children in the mother's absence.

Camille, a mine owner, said that in her day-to-day management everyone respects her because "I understand their needs. The workers are happy when I am there because everything is organised. Things were very disorganised before when only my husband was managing the mine." Camille said that the biggest challenges she faces is the constantly changing and unpredictable price of tin. "You get more money when the price is up, so when the price is up it's good!" Camille is proud of her work because "It is a profession many people fear. People think that only strong people work in mining, like me! They think I must be strong."

Elise, also a mine owner, said she has worked so long in mining she is always surrounded by men, "so people see me as a man and I have trouble socialising with women. Women take me as a man." She went on to say, "All the people I work with and meet, most are men. RMB, *comptoir*, miners…they are all MEN! I don't consider myself as a woman. Women fear me. I am always with men. I don't do makeup and wear perfume like other women."

For some women, they emphasised technical challenges more than other's perceptions as pertinent factors in their businesses. Hélène said her biggest challenges are "workers who steal [minerals] and the cost of modernisation." She said she wants to "digitalise and modernise" her business, "to use more machines and less people." She emphasised how difficult and expensive this was since her mine is situated in an area with minimal main line power supply, necessitating supplementation of electrical power with a generator. She further emphasised that it was difficult for her to find the necessary expertise to expand through mechanical means, especially in geological surveying and locating mineral deposits. Hélène manages an extensive business with more than 100 employees during the high season with a self-reported salary of 1 million RWF per month ($800 USD) after operational expenses. Locally this is considered a good or comfortable monthly income. An export house supervisor once said to me "she is very rich!" in reference to Hélène, showing the perceptions of colleagues towards women holding these high-income earning positions.

Madelaine emphasised that the cooperative has good relations with the community and people respect her. She said *« trouver de l'argent où l'on se trouve des hommes n'est pas facile. Les femmes sont plus responsables que les hommes. »* Translated as "making money where there are men is not easy. Women are more responsible than men." She attributed her success and acceptance by colleagues to her generosity and conviviality with workers, explaining that "I fight for them [the workers] when there are problems. They respect me because I am very generous with them."

Jessica, who worked at the export house, expressed a very positive outlook on women who work in her field. "People think that women who work here are wise. We are perceived as smart because they think we know how to make a living…normally mining is a man's job, so for a woman to work here means you are smart." She went on to say "in mining work, it is physically demanding. Women can't do those things but they do things that require knowledge."

In downstream production roles we see a shift in external perceptions and internal understandings of women's work. Colleagues and those working for women who owned

mines, subcontracted companies and cooperatives, demonstrate and vocalise a greater respect for women in these positions. Rather than “delinquents” or “bad luck charms,” women in downstream production roles are seen as “strong,” “knowledgeable,” “like a friend,” generous and exceptions to the rule. Women attributed their success and respect from others based on bringing “organisation” to the work environment, especially in compared to male colleagues, or husbands. Women’s affluence and financial success also contributed to this respect.

Once successful, women framed and narrated their success and acceptance in terms of masculinities and being “transformed” into a man. African feminist scholars have argued that gender is largely a Western construct and in precolonial African societies sex did not necessarily correspond to gender (Amadiume 1987; Oyěwùmí 1997). Ifi Amadiume argues that in Nigeria prior to colonisation societies were based on a dual-sex system with flexible gender ideologies where women could become “male daughters or female husbands,” holding positions of power equally to men and as such understood as male, shifting between these fluid categories (1987). Amadiume explains that the word for husband in Igbo is genderless and as a result both men or women could hold this position, which is not associated with gender but power and the ability to provide (1987). In another example from Nigeria, Oyèrónké Oyěwùmí argues that in precolonial Yoruba society the category “woman,” in the Western sense, did not exist and that social and political power resided with kinship and lineage rather than gender (1997). These scholars shed light on how colonisation and Western thought has emphasised rigid binaries of sex and gender, creating a patriarchal societal system that did not previously exist, to the detriment of African women (Amadiume 1987; Oyěwùmí 1997). The outcome of this patriarchal system has been the stigmatisation of women when they hold positions of power or exhibit masculine qualities. The experiences of women in these downstream production roles, with corresponding positions of power and success, articulated the fluidity of gender in precolonial African societies. For both Elise and Sylvie, they were seen by their peers, both male and female, as “becoming a man,” shifting into a different social category of power once they achieved success.

It further reflects how women themselves associate positions of power with men and when they reach these positions, they "transform" into men. Women in positions of power assume a "manliness," as if transformed into something strong, knowledgeable and respected, leaving behind weakness, powerlessness and femininity. Like Elise said, she did not wear makeup or perfume like other women and multiple women used the sentence "becoming like a man," in describing their success and acceptance. Reaching affluence, success and power was articulated and narrated as a gendered transformation.

Conclusion

Many gendered divisions of labour emerge within the everyday working context of women in this study, not new to the male-dominated context of mining and extractive work. Many women faced prohibitions on their labour underground and in shovelling work based on notions of physical strength and cultural beliefs, notably that women "lacked the strength" or were perceived as "bad luck." However, as we have seen, these gendered divisions of labour are porous and not universal.

While shovelling work was most persistently considered "the work of men," this was not always the case. In Rwanda there were mine sites where women conducted shovelling alongside men in completely gender-mixed environments. It was so normalised for women they thought I was crazy when I asked them about divisions of labour based on gender in shovelling work. In other sites where shovelling work was dominated by men, there were also exceptions. The experience of Kim, who worked in shovelling with a team of men, is the most telling of examples. Men accepted her work with them because she was perceived as a good luck charm, work she proudly said was her "talent!" The experience of Kim and others show how localised gendered ideologies impact the work of women, further reflecting how arbitrary these divisions. In the case of Kim, the task of shovelling changed from being exclusively male, justified on the grounds that women lacked the strength, to suddenly include women when Kim was invited onto the team and deemed a "good luck charm." What is understood as "men's work" in one mine site, was

completely different in another, and these perceptions changed overnight. Gendered ideologies that influence gendered divisions of labour are highly localised, reflecting the arbitrary nature of these divisions and categories.

This chapter has shown that women's participation in mining has increased under the current mine leadership and broader formalisation efforts of the mining industry in Rwanda which promote women in mining, including underground. However, this initiative clashed with localised norms and gendered ideologies which maintained gendered divisions of labour, even after allowing women into certain mine spaces that historically were exclusively male. For example, although women were allowed in underground mine tunnels, they were also allocated docile tasks like "cleaning" mine tunnels, even when they voiced dissatisfaction in the work and interest in tasks reserved for men. These localised perceptions of gender were again rooted in perceptions of physical ability. We saw that male managers found ways to maintain or renew gendered divisions of labour, despite policies of increased inclusion.

Gendered divisions of labour emerge through a contradiction in perceptions of women's power, as either having not enough physical power or too much meta-physical power. A strong emphasis was placed on perceptions of *imbaraga*, the Kinyarwanda word for strength, relating to the physical body. Strength, referring to the physical and muscular body, was understood as a foundational element to labour outputs, not associated with bodies sexed female. Along this axis, women are perceived to be weak and lacking power to conduct work. However, at other times women were prohibited from mine work for having too much power. Women prohibited from going underground because they were alleged to be witches were perceived to hold a great meta-physical power, a supernatural power that could make minerals disappear, meriting an all-out ban on their participation. Women's power is understood as both physical and meta-physical, existing in a flow between not-enough and too-much, to women's detriment. This shows how the overarching goal is to control the work environment and keep women in certain (largely subordinate) positions.

Associated with these tensions and frictions, women described a shift in the perception of their presence in mining, moving from a strong societal taboo to a slow acceptance, but with remaining negative stereotypes about their labour. In the words of a participant, she described women's presence in mining as no longer, *guca inka amabere*, translated as "to cut the breast of the cow," a Kinyarwanda phrase used to refer to a societal taboo. Her statement is clear, the historic taboo on women's presence in mining is changing. However, there were persistent negative stereotypes, notably the belief that women who work in mining were delinquents. Women responded to these gendered dimensions of work through ruses. In other instances, women just ignored neighbours, community members or wives of miners when experiencing judgement or tensions. In this way, women are redefining and asserting their place in mining.

In the Congolese context women strongly rejected their perceived victimisation, a stereotype that is an oversimplification of their work in mining based on regional dominant narratives. While mineral extraction in DRC is historically linked to conflict and associated with sexual violence in mines, women voiced a clear rejection of this narrative, stating "it does not happen here," referring to rape and sexual violence in mines. It is possible that women rejected victimisation, particularly relating to sexual violence, for fear of reprimand from mining companies or mine site authorities and/or because of my positionality. While it is difficult to be certain as to the motives of women's rejection of victimisation, especially when placed within the broader research context which as I have discussed is one of fear, this is an important ontological point of inquiry because it shows that women seek to insert themselves into dominant narratives and reframe their victimisation, whether that violence does or does not occur. It also shows that women are very aware of master narratives about them and their place in the sector.

In looking to downstream production roles, gendered divisions of labour and the perceptions of women in these positions changed significantly. Women were more respected and faced fewer barriers within their positions. While at mine sites women are frequently considered "delinquents" or "bad luck," mine owners or subcontracted company owners were highly respected and considered knowledgeable. Women

attributed much of their success to their organisational skills and ability to "bring order" to the work environment, as well as to their generosity with local communities.

Throughout this chapter we have seen that women perceive their success and acceptance in mine work in relation to men and masculinities, particularly in downstream production roles. Kim, who conducts shovelling work with men said, "the other teams think it's not normal that a woman can like the shovel so much and do it well, like a man or even better." In downstream production roles, Sylvie and Elise also gauged their success in relation to men. As Sylvie state "[they] perceive me as a man. They call me a man." Elise, too, stated "I don't consider myself as a woman. Women fear me." This partially reflects how the binary of male/female is socially constructed. It also reflects how positions of power and affluence are associated with men, and when women reach these positions they are thought to be transformed into a male identity.

In many ways the gendered divisions of labour and dominant narratives about women in mining, and particularly women mining in the region, foster an imaginary of mining's ongoing male dominance and women's subordination. They consolidate mining as a "male affair," an activity "too dangerous for women." However, women's presence and self-narration of their work and contributions is fostering a slow acceptance and shifting perceptions of their positions in extractivism. Women strongly reject perceived victimisation, asserting and inserting themselves in the sector and contemporary mining landscape. The fact that women insert themselves into dominant narratives, whether related to sexualised violence or "weakness," demonstrates how they are actively reframing the narrative about their place and work in mining.

CONCLUSION: UNDERSTANDING WOMEN'S WORLDS IN EXTRACTIVISM

« Les hommes nous refuse » ("men deny us") said a female miner in DRC in response to my question about whether she had ever gone down an underground tunnel. "No! I'm not allowed to enter the tunnels; the pit owner does not allow women. It is forbidden." The pit owner is male and as I interviewed her, six male diggers worked in the tunnel. In Rwanda, Danielle, who worked in mineral transport, said:

> *"It's not an easy work, that's why not many women do it. It's very demanding of energy, you sacrifice yourself for that work to be completed. You have to get up early and you get home late. Maybe there are only three women who own mines because it is difficult work! It is difficult to find the trust from mine owners. They don't trust women to work for them. It's not an easy work."*

These statements reflect the on-going male dominance in mining and broader extractive context in Central Africa. The male dominance of the sector extended far beyond representation, to include the control of women's labour, their contributions, their potential and their place (literally and figuratively). This male dominance and the subsequently embedded patriarchal scripts about what is considered "women's work" guided the everyday working context for women in this study. Despite this context, women are highly present in mining and downstream production roles, for which gender had significant impacts on their everyday working context. Women experienced exclusions, barriers to work, vulnerabilities and embedded divisions of labour. Even when government and private industry actively promoted women's participation, localised gendered ideologies resulted in new (or renewed) justifications for women's exclusion and gendered allocations of work, impacting the positions that they held and associated incomes.

This dissertation has employed a broad definition of extractivism to include not only mine work, but also downstream production roles, which, although not direct mineral extraction (i.e. the physical extraction of mineral substances), are roles that are vital to

the functioning of the wider mineral supply chain and production processes. In so doing it has identified six primary "nodes" of the 3T mineral supply chain, which I have defined as points of exchange in the production of 3T minerals and where women were active. These six nodes are extraction, processing, mine management, transport, export houses and the export route. Women's participation in extractivism, including all nodes of the supply chain, is most concentrated at mine sites, where they conduct processing, refining and some excavation work. In following the chain to downstream production roles, women's participation decreases. While all mines are male dominated and masculine spaces, men's dominance expands in downstream production roles.

A central theme in this dissertation has been the tensions that exist across the everyday working context for women. While distinct gendered divisions of labour existed (or persisted), these divisions were porous and not homogenous. For example, I have explored how some women did conduct "the work of men," like shovelling, due to special relationships or circumstances with their male colleagues. Women also found opportunities within these gendered dimensions to the labour regime, for example, working through systems of kinship and social capital to start thriving businesses. Given this context of male dominance and exclusion but also tensions and opportunity, this dissertation began by asking how do women make sense of and navigate their work in extractivism?

The ethnographic data and insight discussed in this dissertation show that women respond through two primary methods. 1) through women's narratives of their positions, place and contributions, meaning how they frame and understand their place in extractivism; and 2) their everyday tactics (actions) that contribute to their ongoing presence and successes in the sector. Both factors are interconnected, mutually reinforce each other and constitute women's "ways of operating" (Certeau 1988) in this context.

I have argued that the consequences of these two factors are that women (re)assert their place and space in extractivism, expressing a form of agency both through words and actions. Women's reassertion holds symbolic and practical implications. Through the act

of narrative (including speech acts and language) women reframe and insert themselves into dominant narratives, providing alternative perspectives to their participation and contributions. Furthermore, women's framings of their contributions and reassertion of place in extractivism contributes to a slow acceptance of their work and presence in the sector.

De Certeau theorises tactics as an operational function of "ways of operating" in relation to structures of power which create a power/domination binary and a subordinate "subject" (1988). De Certeau argues that everyday tactics (actions) can hold political dimensions and challenge the power/domination binary, in often subtle but meaningful ways (1988). Throughout this study, I have demonstrated how women's tactics emerge as they respond to the daily manifestations of power drawn along gendered lines. Actions, including for example women working from home or ignoring negative gossip about them, foster tactics used to counter their exclusion and contribute to their acceptance. These are mundane everyday acts that on the surface may not appear to hold significance or power, but upon analysis directly contribute to women's reassertion of belonging in extractivism, both in terms of place and space. I turn now to both of these factors (narrative and tactics) in more detail.

In considering narrative as a form of power and the subsequent implications narrative can have on framing, the most telling of examples of how women used narrative to counter power were when Congolese women said "it does not happen here" in regard to sexualised violence and assault within mining. Here they showed awareness of dominant narratives about women's victimhood. They directly reframe the assumption that they are victims and inserted their perspective and "voice" into those narratives. Women unanimously shared that opinion and statement, including female miners of all ages. While this is epistemologically connected to my positionality as an outsider which could have sparked conversation on that topic, it is also ontologically important for how women wish to narrate their positions in mining in relation to regional dominant narratives and assumptions about them. The nature of working in the mines means that women are confronted with how outsiders (including non-miners and the international community) perceive their work and presence. Whether they experience sexualised violence at or

outside of work is not the point, so much as why women feel it is important to respond to the narrative surrounding their work by largely emphasising non-victimisation. If "narrative and self are inseparable"(Ochs and Capps 1996, 20) then women's rejection of victimisation, through the narrative expressed here, shows that women seek to reframe their perceived position based on their lived experiences as mine workers not as victims, and self-identify as active agents in mining capitalism. It further provides an alternative perspective and reframes dominant narratives, as women insert their own perceptions and identities associated with mine work. Here women speak against mine culture by narrating their own account of the everyday and their place within it (Abu-Lughod 2008a).

Part of these narratives also includes women's intentional silences in response to marginalisation. When women explained that other people (notably community members) interpreted their work in mining as disobedience, using the Kinyarwanda word *ikirara*, they responded with silence. Women told me their responses to these accusations were to ignore them. In an interview a respondent said, "I don't respond and just ignore them… or I try to explain if they are willing to listen." In another interview a respondent similarly said "I just leave people and ignore them. You can't change people." Susan Gal (1989, 2012) suggests that silence can be a form of resistance and power. Following this argument we can ask, do these silences hold broader significance? Accused of violating moral norms, women did not always justify their work or positions but generally opted for silence, reversing the lexicon of power from the speaker. Women did not employ silence as a form of agreement but articulated silence as a response to negative stereotypes about them, revealing an intentional tactic of counter power. Linkages between silence and power become visible. In choosing silence as a mode to counter the negative perceptions some (female and male) community members had against them, women in mining exercised agency and choice as forms of power. This shows not only how intentional silences emerged in women's everyday lives but also that the intentionality of this act of silence reflects agency and choice, a form of power.

In addition to narrative, everyday tactics manifested in this study as ways women asserted their place and space in extractivism. Using Michel de Certeau's framing of tactics as individual everyday actions that are seized "on the wing" and which can act as

a form of counter-power (1988), women's everyday actions contributed to their continued work and place in extractivism. A creative example of this was seen with Pascale and Bernadette who both worked in mining from their homes, making mining work accessible to them. These tactics form women's "ways of operating" (Certeau 1988) which counters gendered power dynamics that exclude them, which we saw included power leveraged against women through the legal system and through mine site authorities.

Women in downstream production roles also used tactical measures to counter gendered inequalities. Many of the women who worked in high-income earning positions, such as mine owners, leveraged kinship networks and social capital (Bourdieu 1986) to start or improve their businesses, an intentional tactic towards success, as we saw with Elise and Sylvie (Chapter Four). Women working at export houses and in mineral transport also leveraged kinship networks to secure jobs in extractivism, as we saw with Jessica (Chapter Four). These tactics contribute to reappropriating time and space in the industry by countering existing power dynamics that are otherwise very male dominated. Women created jobs and businesses for themselves and a physical female presence in extractivism through these tactics. Rather than "strategies" (highly organised and centralised, as De Certeau conceptualises), the "tactics" used by women were highly individualised, uncoordinated and emerged organically. Importantly these actions are not articulated by women as intentional tactics of counter-power or as resistance. Rather they are conceptualised amongst participants as responses and mundane everyday acts. Furthermore, this dissertations analysis of women's "tactics" has focused on individual acts and agency rather than on collective experiences or forms of gendered solidarity. My previous academic work has explored gendered solidarity between women in mining and how it benefited women's involvement in the sector (Furniss 2023). While an interesting point of inquiry into women's "everyday experiences," it was not the focus of the present study, which sought analysis of differing individual experiences.

Narration and action, both of which are "ways of operating" (Certeau 1988), contribute to a reframing of the perceptions of women in extractivism and a slow acceptance of their work and place in the sector. Many respondents shared positive accounts of shifts in others' views about their work underground or aboveground. Women's presence and

persistence in the sector challenges existing rejections of their place and how extractive work is understood by others. In Rwanda, when a respondent said that a woman working in mining is no longer *guca inka amabere* ("to cut the breast of the cow"), meaning taboo, she spoke to a shifting societal perception and acceptance of women's work in mining and extractivism more broadly. Furthermore, women's accounts of changing perceptions were strongly present-tensed. They frequently used "I" or "now" in their accounts, comparing to a past in which opportunities and their roles would have been more limited. In Rwanda, this shows how women have taken note of a shift in the perceptions of their work in mining. This is important because it centres women's perspectives of their work and livelihoods in extractivism in their own words and through their lens. This reframes dominant narratives and stereotypes of women, such as victims or delinquents, through women's voices.

This dissertation has also argued that women experience extractive violences as labourers along an extractive frontier. Chapter Five explored four ways in which gendered exploitation, disposability and embodied violences occur. This included through financial extortion, physical exploitation, motherhood responsibilities and toxicity in mine work. Women were exploited for money and sex, their bodies expected to be sponges of mine waste and toxins, exploited as labourers until they gave birth, then dismissed as "lost investments." Rather than seen as human or mine workers at the heart of production and modernity, they were deemed disposable by male gatekeepers, companies and authorities. Aimé Césaire's (2000) conceptualisation of "thingification" within the colonial endeavour, in which humans and nature are equally objects of exploitation, still resonates in the current post-colonial moment, which continues these practices of dehumanisation and exploitation; in many ways this repeats history, with a strong gendered focus. Women's accounts of their experiences demonstrate contemporary manifestations of brutality, objectification and exploitation occurring very much within the everyday. Being forced to pay a weekly "fee to work" by Mine Police in order to access mine sites is an everyday material violence that exists within the ordinary. Or when mining companies do not re-hire women after giving birth, they are thrown away as objects, no longer seen as valuable. I proposed that this exploitation, disposability and dehumanisation is a result of "extractive logics" (Murrey and Mollett 2023), which relies

on and requires these exploitative practices in extractivism and in broader capitalist modes of production. In many ways, these extractive violences echo the broader context of everyday violences (Nordstrom and Robben 1995) in which this study took place, as discussed in Chapter Two, where everyday violences, as subtle violences within broader environments of conflict, presented both opportunities in research but also constraint.

The current global supply chain of 3T's in the manufacturing of digital technologies is strongly shaped by the past. Extraction of people and natural resources was at the heart of the colonial endeavour, which was implemented brutally in Central Africa (Hochschild 1999). 3T's are commodities at the heart of modernity, extracted for the benefit of anthropogenic capital accumulation primarily situated in the Global North. In many ways the past continues to repeat itself, under new guises and amidst heightened local grievances and conflict. This aligns with Alberto Acosta's analysis of forms of (neo)extractivism, discussed in the introduction, where natural resource extraction is prioritised for global markets and not local communities or nature alike (Acosta 2013). With a rich body of literature on this notion spearheaded from Latin America, points of inquiry within the African context remain open for further analysis and conceptualization of (neo)extractivism and its discontents.

Challenging Imaginaries: Central Themes for Women Who Work in Extractivism

In this dissertation I have endeavoured to (en)gender the 3T mineral supply chain, meaning to both "give rise to" women's experiences and to show how the supply chain is gendered, by spotlighting women's experiences. We have seen that women occupy multiple and varying roles at different nodes along the entirety of the 3T mineral supply chain, from miners and transporters to mine owners and export house labourers. This alone is important, given the male dominated nature of extractivism. This dissertation has thus made women and their diverse experiences visible. It further expands our understanding of women's roles beyond mine work to include downstream production roles, which has shown that women can be affluent, successful and have a high degree

of agency in their work in extractivism. Within these varying positions, women's work regime is gendered, affecting a wide range of experiences from gendered divisions of labour and work rhythms to gendered vulnerabilities and gendered opportunities.

In considering women's motivations for work in extractivism, I have argued that women choose to work in mining and do not do so for mere survival. However, it is also the case that women who work at mine sites face a more limited choice than women in downstream production roles. Here, I divide women's motivations as either that of economic necessity or economic opportunity. At node one and two of the supply chain, mine work provides an important livelihood strategy for women who face limited economic alternatives. The low barriers to entry and the geographic proximity of mines to women's homes make mine work available and highly accessible for women. The mines also provided economic opportunity for women whose businesses in other sectors failed or provided higher incomes than other sectors at the local level, like agriculture. Further argued in Chapter Four, women's mobility to higher income earning positions and their success in downstream production roles was premised on the presence or absence of social capital. Pierre Bourdieu conceptualises social capital as social and familial relations and connections that translate into economic outcomes (1986). Women at mine sites in Rwanda turned to mine work precisely because they lacked the "connections" necessary to get jobs in other sectors, like construction. As a result of their "negative social capital" (Wacquant 1998), and the mine companies' more equal hiring practices, mine work became an option for them. This was the opposite of women in downstream production roles who required social capital to access work and start businesses.

By tracing the positions and incomes of women along the 3T mineral supply chain, we see that women's participation decreases as income earning potential increases, in an inverse relationship. As discussed in Chapter Three, using a descriptive profile of one woman at each node of the supply chain, there is a consistent increase in wages at each position of income generation from mines onwards. Miners make by far the lowest incomes, which are seldom more than $30 USD per month. Congolese artisanal miners may go days without earning anything if production and mining conditions are bad (such

as due to rain or conflict). On average, mine workers earned between $30 and $100 USD per month. Those who founded cooperatives or companies that supply the subcontracted labour force earned much higher wages, in the range of $700-$2000 USD per month. Mine owners earn by far the highest profits in the range $2500 USD per month and above. Women working in mineral transport earned in the range of $300 USD per month and those working at export houses earn in the range of $120 USD per month and up.

Gendered divisions of labour also changed from mines to downstream production roles. The most telling of examples was seen with processing work categorised as "women's work" at the mine site, as women are seen as "too weak" to conduct underground extraction and (often) shovelling work. However, as you follow the supply chain to export houses, processing work became "the work of men," considered "too difficult" for women, who are pushed to administrative tasks. This shows how arbitrary these categories and restrictions on women's labour are. Another significant change from node one (extraction) to five (export house) on the supply chain, meaning from mine workers to downstream production roles, was the change in acceptance of women and their respectability. Women at nodes one and two of the supply chain, who worked in excavation and processing, faced many negative stereotypes for their participation, including being labelled delinquents or witches. Counter to this, women in downstream production roles, positions of greater affluence and success, were well respected, considered knowledgeable and accepted. As explored in Chapter Six women reported this in terms of a gendered transformation, where women were seen to be transformed from "weak women" or "witches" to "strong" and "knowledgeable," becoming "like a man." How women articulated their successes and acceptance was no longer associated with womanhood but in terms of joining perceived male worlds and identities. As powerful and successful women, they transgressed gendered binaries.

Not a "single story" of women working in extractivism

Close attention to the frictions and tensions between dominant narratives and women's accounts suggests caution about "the single story" (Adichie 2009) of gender and extractivism. While gendered vulnerabilities and gendered forms of exploitation have been discussed – serious and important considerations – women challenge dominant narratives, especially those that foreground victimisation. In many cases women enjoyed their jobs and actively pursued extractive work. As Hélène, a subcontracted company owner said, "I like adventure!" and "I could never *not* work in mining!" Or Kim, who said shovelling was her "talent!" Or Elise who owned a mine for 28 years and said "I like mining! It has provided a living for me." These women identified and expressed a strong connection to the sector. Women reported financial stability from their work and were proud to be able to support their children and families. Women also reported working in harmonious environments in collaboration with their husbands, family members (frequently male) and mentors. While women brought up experiences of sexual and gender-based violence (SGBV), since it affected their "everyday" in some cases, SGBV was one form of exploitation amongst many which women faced. In DRC it was strongly rejected. It was also not universally experienced amongst participants, and in cases where it was reported, it was experienced to differing degrees. As such there is no singular or homogeneous "experience" of women in mining 3T minerals. Rather, we see everyday pluralities in women's experience and "ways of operating" (Certeau 1988) in navigating or responding to these pluralities.

Furthermore, women in downstream production roles, particularly those who owned mines, subcontracted companies or who started collectives, went to great lengths and took tremendous financial risk to work in extractivism. Many of these women quit secure salaried employment to pursue mining businesses. Some invested all their savings and, as Madelaine showed, sold some of her household goods to cover the start-up costs. As the income tracking graph in Chapter Three shows, mine owners earned enough for a comfortable living including, in some instances, sending their children to university overseas. Far from the single story of victimisation and exploitation, these examples

show how women benefit from extractivism and the opportunities that are available to them.

Kinship networks and instances of intergenerational mining strongly influenced women's familiarity with mine work and facilitated access to downstream production roles. In Rwanda there were many instances where three or four generations of women's family members had been involved in mine work. In previous generations, mine workers in their families had been majority men, but this is shifting. At mine sites in DRC, women frequently learned mining from relatives, husbands or friends who invited them to go work in the mines. At export houses and women working in mineral transport, family connections were vital, premised on notions of enhanced "trust" through kinship networks. Trust itself is a theme in this dissertation, underpinning the methodology and epistemology as a factor affecting and impacting women's everyday lives and the environment in which this study was conducted. Contrary to most literature on women in mining in the region and in Africa more broadly, the women in this study were not migrant labourers but born and raised in mining villages and communities. These deep connections to the mining sector show deeply rooted genealogies of extractivism within communities.

The extractive context in which women work is one of blurred spaces and temporalities despite an emphasis (locally and internationally) on separation and distinction. "The mine" is considered a distinct place, both legally and by corporate actors and authority figures. It is enforced as if so, and treated as void of interconnected histories of living, subsistence farming, extractivism, violence and displacement. Many of the communities in this study have legacies of intergenerational mining, centring mining in the memories of residents. Despite a lack of physical separation, such as a wall or fence, the illusive "mine" is imagined as a distinct place of work, production and masculinities, not of living or thriving. In reality "the mine" exists within a blended space of living, farming and extracting. This blurring has benefits for women as it facilitates tactics they used to evade exclusions, exploitation and marginalisation, such as working from home. Notably, if working illegally, for example without a permit or while pregnant, the extension of "the mine" to "the home" fosters inclusion for women who, in many cases, face limited

economic alternatives and desire to be beneficiaries of natural resource extraction. I have also shown (Chapter Three) that the 3T mineral supply chain is not linear, and does not follow a neat or clean production process from mines to market. Rather it is tangled within communities and homes and the relationships they contain.

The blending of space exists in parallel with the blending of women's identities. Although at work women are considered "miners," as if separated from family obligations or other considerations, in reality they hold plural identities which affects their work context, notably in relation to motherhood. The vast majority of female participants in this study had children and frequently cited their children's wellbeing as a vital consideration in their work. Their mothering identities often had negative implications for their job security, wellbeing and the wellbeing of their children. This emerged in multiple ways. Women faced risk of sexual exploitation from male managers when broader conditions of poverty fostered a desperation for a job or continued income relating to motherhood obligations, for example, because "the man will buy milk for their children." Women frequently foregrounded their children's wellbeing when describing what worried them the most regarding job security. That is, strong gendered norms about who is responsible for childcare continue to shape how women are able to be workers. In addition, corporate policy, which denies a woman leave for a sick child, meant that women would lie about illness in order to balance childcare obligations. Women's identities as mothers and miners are inseparable, just as spaces of work and living coexist, but the fantasy of a single-faceted "worker," premised on a masculinist imaginary, precludes a clear understanding of pluralities as they affect women.

Corporate and government interventions that promote women in mining do have a positive impact on women's integration and participation in mine work. The company that provided the fieldsite for this study actively promoted women in underground work and more broadly in the workforce, contributing directly to women's increased participation in the sector. Government intervention to promote the mining industry, particularly specialty positions requiring higher education, like mining engineering, also positively promoted women's access to the mining industry. However, these policies clashed with

localised gendered ideologies which, as explored in Chapter Six, resulted in new (or renewed) gendered divisions of labour.

While certainly more studies of women who work in mining and downstream production are necessary, this dissertation adds to existing literature by challenging dominant narratives about women in mining, which tends to emphasise victimisation and women's invisibility. Far from passive victims, women in this study are active agents in and, in some cases, beneficiaries of mining capitalism. Their tactics enable them to maintain work in mining and they insert themselves into dominant narratives, providing alternative perspectives. Following women along the production and supply chain, we can see the gendering of the processes of production that sit at the heart of modernity and global connection.

In considering the varying findings of this study, from women's diverse experiences to how they frame and understand their work, this dissertation has provided a unique contribution to our understanding of extractivism and global supply chains through a gendered lens. Notably, this is the first study that includes women across the 3T mineral supply chain, beyond only mining sites. It is also the first study to research this topic across the differing country contexts of Rwanda and DRC, which, as discussed in the introduction, sit in political tension with each other despite their intertwined histories and continued connections. The dissertation has provided a nuanced perspective on forms of violence and exclusion experienced by women and how gendered ideologies and practices are changing or being reproduced. For example, Chapter Five has added to a highly understudied subsection of women's gendered experiences in extractivism by including accounts of adverse health impacts. It also centred women's perspectives and voices, focusing on their diverse roles and experiences. Lastly, this dissertation has shown how master narratives fall apart and how frictions emerge between local and global practices, beliefs and systems of production.

On Capitalist Modes of Production and Extractive Frontiers in the Anthropocene

Throughout this study participants would often ask me what coltan or tin was used for, telling me they thought these minerals were needed to make bullets, guns, casserole pots or shovels, commodities that are familiar to them. At the other end of the supply chain, most end-users of the commodities that require 3T's in their manufacturing, like cell phones, are likely to have minimal knowledge of where the minerals and metals that make up their devices come from or what the working context is like in these "shadow places" (Plumwood 2008). These kinds of invisibilities, gaps in knowledge and inequalities of all forms (from profits to access) are the definitional aspects of capitalist modes of production and accumulation within the Anthropocene, where the pole of production and pole of consumption could not be further apart – physically, geographically and symbolically. Global supply chains like this one are contributing to modernity, as devices and digital technologies become smarter, smaller and more prolific. Although some women did not know what the minerals they mined were used for, other women (particularly in downstream production roles) knew very well and followed the global market price of 3T's. Frictions and tensions continue. Similarly, while not all participants in this study had smartphones, many did. Many participants also expressed a desire for these types of devices, from iPhones to flat screen tv's (if they did not already own them). The recent anthropological work of James H. Smith (2021) has helped us understand and unpack global connection through his analysis of male artisanal miners in eastern DRC and how the digital revolution has directly impacted their lived realties. Rather than follow dominant narratives that mining has caused conflict, one of Smith's central arguments is the reverse, that conflict has caused a robust local mining economy. This more nuanced and granular perspective, based on the views of miners themselves, has challenged dominate narratives, much as I have done here. This dissertation adds to this rich analysis by focusing on women and considering gendered implications to modes of life within broader systems of production. This contributes to an expanded analysis of global connection and fills ongoing gaps in understanding global connections while nuancing the account of gender along the 3T supply chain.

While this study has zoomed in on the details of everyday life and subtleties of the mundane and ordinary amongst women who work along the 3T supply chain, let us now zoom out. In considering the overall processes involved with manufacturing digital technologies, anthropogenic inequalities are made visible through the labour context of women in this study. At the pole of production, we have seen extreme inequalities, from disparities in wages and working conditions to access to work and exploitation. We have also seen everyday violences in women's lives, normalised within ordinary routines of living and justified through prevailing gender norms. If we juxtapose this context against the pole of consumption, like the annual profits of multinationals (like Tesla) that buy the minerals to which women's labour contributes, or if we look at the price of commodities (like iPhone's) that require these minerals, the inequalities are enormous. In the most extreme example, some women in this study earn less than $1 USD per day, while the 2023 annual profits for Tesla (one of many companies that requires 3T's for the digital components in their electric vehicles and other innovations) was 13.4 billion USD (Pizio 2024).

The mechanics of unequal capital accumulation unfold along extractive frontiers. For example, the outsourcing of labour and contracts at mine sites and along the supply chain (from miners to truck drivers) has created a system of exploitation, of people and nature alike. When a truck driver has to buy their own petrol to export minerals or a miner is paid based on production, these micro-practices turn the wheels of capital accumulation at the pole of consumption. These practices are the exploitative foundation of capitalist accumulation. Under new guises of value, as global commodity demands create new markets and present financial opportunities in distant locations, extractive frontiers based on exploitation are continually (re)produced. The decisions and directives of multinational companies primarily situated in the global North, what Anna Tsing calls lead "firms" (2009), trickle down to individuals and communities in everyday ways, many of which have been explored in this dissertation. For example, the implementation of mineral traceability schemes has consolidated women's exclusion from mining through gendered protectionist discourse, meant to "save" women miners from sexual and labour exploitation. This further reflects the two-way flow of outputs

along this supply chain. Production, labour and goods flow out from Africa's Great Lakes region with demands, restrictions and intervention flowing back.

There is an inherent anti-feminism to capitalist modes of production and accumulation, which are systems of production premised on labour exploitation, dominance and dehumanisation. The system is built and founded on the uneven distribution of labour, power and wealth. Within the everyday working context of Central African artisanal and small-scale mines, women, as men, are labourers of a system that is built to exploit them, and which can only be put in motion because of that exploitation. However, as I have explored, women as labourers in this system of production experience additional layers of exploitation and vulnerabilities because of their gender, often at the hands of male gatekeepers. The irony of this is that women experience extractive violences, in gendered ways, by those similarly exploited under the capitalist system in which they all work. In addition, labour outputs that turn of wheel of extractivism in capitalist modes of production and accumulation demand mechanical bodies, predetermined as masculine. Women's bodies, sitting in opposition to this imaginary, are deemed weak, lacking *imbaraga* (strength) for labour outputs. However, as we saw, this imaginary can change quickly and is just that – imagined.

Despite this, women in this study are not completely excluded from benefiting from these systems of production and consumption. The tensions and frictions of value-making have been a central theme of the dissertation. The working context for women can be one of exploitation but also of opportunity. Some women experience low wages and barriers to work, while others were affluent and successful. Similarly, tensions also exist when we zoom out of "the everyday" to the overall supply chain. Income opportunities for women grew in downstream production and working conditions improved. Perhaps it is this potential for opportunity that unites the poles of consumption and production as sites of wanting – wanting more, striving for more, consuming more.

Importantly, extractive frontiers in this study were also sites of living. The blending of home spaces, agricultural farmlands and mines was consistent across this study and is definitional to the anthropocene. While historically land was taken away to create mines,

some mine sites have now been abandoned, transformed into agricultural fields, creating stark visuals of goats grazing and casava growing at abandoned mine shafts. Hauntings surround these sites as residents recounted stories of shafts that collapsed and miners who died. While mines sometimes displace and take away life, abandoned mine sites can transform to provide life, creating contradictory co-existences. However, the toxicity of these sites is evident and has gendered health impacts as the violences of capitalism come to women's front doors. The lasting impact of these sites is yet to be completely understood. This raises questions of how slow violences (Nixon 2011) may impact the lives of women, communities and future generations when farm soil and mine soil are one and the same.

If anthropology is a science in search of meaning (Geertz 2008) and one that seeks to tell stories (Abu-Lughod 1990a), this dissertation contributes to our understandings of women's social worlds of work along a vital global supply chain. At the centre of women's stories shared with me and discussed in this dissertation is women's active involvement in extractivism and their assertion of a right to a place within the sector. Analysis of the mineral in motion through a gendered lens has shown that many barriers remain to women's incorporation on fair terms. However, the way women perceive their place, work and contributions shows that they seek and will continue to seek a livelihood through extractivism, countering gendered ideologies and exclusions.

REFERENCES:

Abu-Lughod, Lila. 2002. "Do Muslim Women Really Need Saving? Anthropological Reflections on Cultural Relativism and Its Others." *American anthropologist* 104 (3): 783-790. https://doi.org/10.1525/aa.2002.104.3.783.

---. 2008a. "Writing against culture." In *The cultural geography reader*, 62-71. Routledge.

---. 2008b. *Writing women's worlds: Bedouin stories*. Univ of California Press.

Abu-Lughod, Lila. 1990a. "Can there be a feminist ethnography?" *Women & Performance: a journal of feminist theory* 5 (1): 7-27.

---. 1990b. "The romance of resistance: Tracing transformations of power through Bedouin women." *American ethnologist* 17 (1): 41-55.

Acosta, Alberto. 2013. "Extractivism and neoextractivism: two sides of the same curse." *Beyond development: alternative visions from Latin America* 1: 61-86.

Adekunle, Julius O. 2007. *Culture and customs of Rwanda*. Bloomsbury Publishing USA.

Adichie, Chimamanda Ngozi. 2009. "The danger of a single story ". TedX. Accessed 17 December 2024. https://www.youtube.com/watch?v=D9Ihs241zeg.

Administration, US International Trade. 2024. "Democratic Republic of the Congo - Market Overview ". US International Trade Administration Accessed 27 January https://www.trade.gov/country-commercial-guides/democratic-republic-congo-market-overview.

Affairs, United Nations Office for the Coordination of Humanitarian. 2025. "Democratic Republic of the Congo: Overview ". United Nations. Accessed 19 March https://www.unocha.org/democratic-republic-congo.

Africa24. 2024. "Rwanda: Mineral Exports Earnings Rise to 1.1 Billion dollars in 2023." Africa24. Accessed 27 January https://africa24tv.com/rwanda-mineral-exports-earnings-rise-to-1-1-billion-dollars-in-2023.

Alcoff, Linda, and Elizabeth Potter. 2013. *Feminist epistemologies*. Routledge.

Amadiume, Ifi. 1987. *Male daughters, female husbands : gender and sex in an African society*. London: Zed Books.

Ansoms, An, Esther Marijnen, Giuseppe Cioffo, and Jude Murison. 2017. "Statistics versus livelihoods: questioning Rwanda's pathway out of poverty." *Review of African Political Economy* 44 (151): 47-65.

Appadurai, Arjun. 1988. *The social life of things: Commodities in cultural perspective*. Cambridge University Press.

Association, International Tin. 2025. "Alphamin suspends mining operations at Bisie." International Tin Association. Accessed 17 March https://www.internationaltin.org/alphamin-suspends-mining-operations-at-bisie/.

Autesserre, Séverine. 2010. *The Trouble with the Congo: Local Violence and the Failure of International Peacebuilding*. 1 ed. Vol. 115.*Cambridge Studies in International Relations*. New York: Cambridge University Press.

---. 2012. "Dangerous tales: Dominant narratives on the Congo and their unintended consequences." *African affairs (London)* 111 (443): 202-222. https://doi.org/10.1093/afraf/adr080.

Baaz, Maria Eriksson, and Judith Verweijen. 2013. "The volatility of a half-cooked bouillabaisse: Rebel-military integration and conflict dynamics in the eastern

DRC." *African affairs (London)* 112 (449): 563-582. https://doi.org/10.1093/afraf/adt044.
Bair, Jennifer. 2005. "Global Capitalism and Commodity Chains: Looking Back, Going Forward." *Competition & change* 9 (2): 153-180. https://doi.org/10.1179/102452905X45382.
Ballard, Chris, and Glenn Banks. 2003. "Resource wars: the anthropology of mining." *Annual review of anthropology* 32 (1): 287-313.
Banchirigah, Sadia Mohammed, and Gavin Hilson. 2010. "De-agrarianization, re-agrarianization and local economic development: Re-orientating livelihoods in African artisanal mining communities." *Policy Sciences* 43: 157-180.
Bank, World. 2017a. "Advocacy for Women's Rights in DRC's Mines Gains Momentum ". World Bank Group Last Modified December 19, 2017. Accessed May 14. https://www.worldbank.org/en/news/feature/2017/12/13/advocacy-for-womens-rights-in-drcs-mines-gains-momentum.
---. 2017b. "Stories of Women in DRC's Mining Sector Spark National Action Plan." World Bank Group. Last Modified October 25, 2017. Accessed May 14. https://www.worldbank.org/en/news/feature/2017/10/25/in-the-drc-stories-of-women-in-the-mining-sector-spark-national-action-plan.
---. 2023. *2023 State of the Artisanal and Small-Scale Mining Sector*. World Bank (Washington, D.C.).
Bashwira, Marie-Rose. 2017. "Navigating obstacles, opportunities and reforms: women's lives and livelihoods in artisanal mining communities in eastern DRC." Wageningen University and Research.
Bashwira, Marie-Rose, and Jeroen Cuvelier. 2019. "Women, mining and power in southeastern Democratic Republic of Congo: The case of Kisengo." *The Extractive Industries and Society* 6 (3): 960-967.
Bashwira, Marie-Rose, Jeroen Cuvelier, Dorothea Hilhorst, and Gemma van der Haar. 2014. "Not only a man's world: Women's involvement in artisanal mining in eastern DRC." *Resources policy* 40 (1): 109-116. https://doi.org/10.1016/j.resourpol.2013.11.002.
Bashwira, Marie-Rose, and Gemma van der Haar. 2020. "Necessity or choice: women's migration to artisanal mining regions in eastern DRC." *Canadian journal of African studies* 54 (1): 79-99. https://doi.org/10.1080/00083968.2019.1674170.
Bayat, Asef. 2013. *Life as politics how ordinary people change the Middle East*. 2nd ed. Stanford, Calif: Stanford University Press.
Begley, Larissa. 2009. "The other side of fieldwork: experiences and challenges of conducting research in the border area of Rwanda/eastern Congo." *Anthropology Matters* 11 (2).
---. 2013. "The RPF control everything! Fear and rumour under Rwanda's genocide ideology legislation." In *Emotional and ethical challenges for field research in Africa: The story behind the findings*, edited by Susan Thomson, Ansoms, An, and Murison, Jude, 70-83. Springer.
Benya, Asanda. 2017. "Going underground in South African platinum mines to explore women miners' experiences." *Gender & Development* 25 (3): 509-522.
Berry, Marie E. 2015. "When "bright futures" fade: Paradoxes of women's empowerment in Rwanda." *Signs: Journal of Women in Culture and Society* 41 (1): 1-27.

Blommaert, Jan, and Dong Jie. 2020. *Ethnographic fieldwork: A beginner's guide*. Multilingual Matters.
Bonthuys, Elsje, and Cathi Albertyn. 2007. *Gender, law and justice*. Juta and Company Ltd.
Bourdieu, Pierre. 1980. "Le capital social." *Actes de la recherche en sciences sociales* 31: 2-3. https://www.persee.fr/doc/arss_0335-5322_1980_num_31_1_2069.
---. 1986. "The Forms of Capital " In *Handbook of Theory and Research for the Sociology of Education* edited by John G Richardson, 241-258. New York, Westport, Connecticut, London: Greenwood Press.
Bryceson, Deborah Fahy, and Sara Geenen. 2016. "Artisanal frontier mining of gold in Africa: Labour transformation in Tanzania and the Democratic Republic of Congo." *African Affairs* 115 (459): 296-317.
Bryceson, Deborah Fahy, and Jesper Bosse Jønsson. 2010. "Gold digging careers in rural East Africa: small-scale miners' livelihood choices." *World Development* 38 (3): 379-392.
Bryceson, Deborah Fahy, Jesper Bosse Jønsson, and Hannelore Verbrugge. 2014. "For richer, for poorer: marriage and casualized sex in East African artisanal mining settlements." *Development and Change* 45 (1): 79-104.
Burawoy, Michael. 1991. *Ethnography unbound: Power and resistance in the modern metropolis*. Univ of California Press.
Burton, Jason. 2022. "U.S. Geological Survey Releases 2022 List of Critical Minerals ". The United States Geological Survey Accessed January 21. https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals.
Buss, Doris. 2018. "Conflict minerals and sexual violence in Central Africa: troubling research." *Social Politics: International Studies in Gender, State & Society* 25 (4): 545-567.
Buss, Doris, and Blair Rutherford. 2020. "Gendering women's livelihoods in artisanal and small-scale mining: an introduction." *Canadian journal of African studies* 54 (1): 1-16. https://doi.org/10.1080/00083968.2019.1691028.
Buss, Doris, Blair A Rutherford, Jennifer Hinton, Jennifer M Stewart, Joanne Lebert, Gisèle Eva Côté, Abby Sebina-Zziwa, Richard Kibombo, and Frederick Kisekka. 2017. *Gender and artisanal and small-scale mining in central and east Africa: Barriers and benefits*.
Buss, Doris, Blair Rutherford, Cynthia Kumah, and Mary Spear. 2021. "Beyond the rituals of inclusion: The environment for women and resource governance in Africa's artisanal and small-scale mining sector." *Environmental science & policy* 116: 30-37. https://doi.org/10.1016/j.envsci.2020.10.019.
Byemba, Gabriel Kamundala. 2020. "Formalization of artisanal and small-scale mining in eastern Democratic Republic of the Congo: An opportunity for women in the new tin, tantalum, tungsten and gold (3TG) supply chain?" *The extractive industries and society* 7 (2): 420-427. https://doi.org/10.1016/j.exis.2020.03.001.
Certeau, Michel de. 1988. *The practice of everyday life*. Berkeley: University of California Press.
Césaire, Aimé, and Robin D. G. Kelley. 2000. *Discourse on colonialism*. *Poetics of anticolonialism*. New York: Monthly Review Press.

Chatterjee, Partha. 2004. *The politics of the governed : reflections on popular politics in most of the world*.*Leonard Hastings Schoff memorial lectures*. New York: Columbia University Press.
Commission, European. 2023. "Critical raw materials ". Accessed July 10. https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en.
Congo, Group of Experts on the Democratic Republic of the. 27 December 2024 2024. *Midterm report of the Group of Experts on the Democratic Republic of the Congo* United Nations Security Council (United Nations). https://documents.un.org/doc/undoc/gen/n24/373/37/pdf/n2437337.pdf.
Cousins, Thomas. 2023. *The Work of Repair: Capacity after Colonialism in the Timber Plantations of South Africa*. First edition ed.*Thinking from elsewhere*. New York: Fordham University Press.
Crenshaw, Kimberlé. 1989. "Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics." *u. Chi. Legal f.*: 139.
Crush, J. S., Alan Jeeves, and David Yudelman. 1991. *South Africa's labor empire : a history of Black migrancy to the gold mines*.*African modernization and development series*. Boulder: Westview Press.
Custers, Raf, Jeroen Cuvelier, and Didier Verbruggen. 2009. *Culprits or Scapegoats? Revisiting the role of Belgian mineral traders in eastern DRC*. IPIS (Antwerpen).
Cuvelier, Jeroen. 2014. "Work and masculinity in Katanga's artisanal mines." *Africa Spectrum* 49 (2): 3-26.
---. 2017. "Money, migration and masculinity among artisanal miners in Katanga (DR Congo)." *Review of African Political Economy* 44 (152): 204-219.
Cuvelier, Jeroen, Steven Van Bockstael, Koen Vlassenroot, and Claude Iguma. 2014. *Analyzing the impact of the Dodd-Frank Act on Congolese livelihoods*. Social Science Research Council.
D'Angelo, Lorenzo, and Robert Jan Pijpers. 2022. *The anthropology of resource extraction*. Routledge.
D'Souza, Kevin. 2007. "Artisanal mining in the DRC: Key issues, challenges and opportunities." *Communities and Small-Scale Mining, Staffordshire*.
Danielsen, Katrine, and Jennifer Hinton. 2020. "A social relations of gender analysis of artisanal and small-scale mining in Africa's Great Lakes Region." *Canadian journal of African studies* 54 (1): 17-36. https://doi.org/10.1080/00083968.2019.1676807.
Das, Veena. 2007. *Life and words : violence and the descent into the ordinary*.*A Philip E. Lilienthal book in Asian studies*. Berkeley: University of California Press.
---. 2021. *Textures of the ordinary : doing anthropology after Wittgenstein*. First edition. ed.*Thinking from elsewhere*. New York: Fordham University Press.
Das, Veena, and Shalini Randeria. 2015. "Politics of the urban poor: aesthetics, ethics, volatility, precarity: an introduction to supplement 11." *Current Anthropology* 56 (S11): S3-S14.
Davies, Charlotte Aull. 2012. *Reflexive ethnography a guide to researching selves and others*. 2nd ed.*ASA research methods*. London ;: Routledge.
De Boeck, Filip. 1996. "Postcolonialism, power and identity: local and global perspectives from Zaire." *Postcolonial identities in Africa* 75: 106.

---. 1998. "Domesticating diamonds and dollars: Identity, expenditure and sharing in southwestern Zaire (1984–1997)." *Development and Change* 29 (4): 777-810.
---. 2016. "At risk, as risk: abandonment and care in a world of spiritual insecurity." In *The Devil's Children*, 129-150. Routledge.
De Boeck, Filip, and Marie-Françoise Plissart. 2014. *Kinshasa: tales of the invisible city*. Leuven University Press.
de Haan, Jorden, and Sara Geenen. 2016. "Mining cooperatives in Eastern DRC The interplay between historical power relations and formal institutions." *The extractive industries and society* 3 (3): 823-831. https://doi.org/10.1016/j.exis.2016.05.003.
Debusscher, Petra, and An Ansoms. 2013. "Gender equality policies in Rwanda: public relations or real transformations?" *Development and Change* 44 (5): 1111-1134.
Des Forges, Alison. 1995. "The ideology of genocide." *African Issues* 23 (2): 44-47.
Elson, Diane, and Ruth Pearson. 1981. "'Nimble Fingers Make Cheap Workers': An Analysis of Women's Employment in Third World Export Manufacturing." *Feminist review* 7 (1): 87-107. https://doi.org/10.1057/fr.1981.6.
Englund, Harri. 2024. "African languages and untranslatables: Reflections on “decolonial knowledge”." *Africa* 1 (1): 135-150.
Escobar, Arturo. 1995. *Encountering development : the making and unmaking of the Third World*.*Princeton studies in culture/power/history.* Princeton: Princeton University Press.
Foucault, Michel. 1977. *Discipline and punish : the birth of the prison*. 1st American ed. New York: Pantheon Books.
---. 1980. *Power/knowledge: Selected interviews and other writings, 1972-1977*. Vintage.
---. 1982. "The Subject and Power." *Critical inquiry* 8 (4): 777-795. https://doi.org/10.1086/448181.
---. 1988. *The history of sexuality*. 1st Vintage Books ed. Vol. 1. New York: Vintage Books.
---. 1991. "Governmentality." In *The Foucault Effect: Studies in Governmentality* edited by Graham Burchell, Gordon, Colin, and Miller, Peter., 87-104. Chicago University of Chicago Press.
Freidberg, Susanne Elizabeth, and Susanne Freidberg. 2004. *French beans and food scares: Culture and commerce in an anxious age*. Oxford University Press on Demand.
Fund, United Nations Population. 2024a. "World Population Dashboard Rwanda ". United Nations Population Fund. https://www.unfpa.org/data/world-population/RW.
---. 2024b. "World Population Dashboard, Congo, the Democratic Republic of the." United Nations Population Fund. Accessed 27 January. https://www.unfpa.org/data/world-population/CD.
Furniss, Allison. 2021. "“Je Cherche La Vie!”: Women's Labour Politics in Masisi's Artisanal Coltan Mines." University of Cape Town. http://hdl.handle.net/11427/33895.
---. 2022. "“Les femmes n'ont pas le droit!”: Social and legal exclusions of female artisanal coltan miners in eastern Democratic Republic of the Congo." *The extractive industries and society* 12: 101167. https://doi.org/10.1016/j.exis.2022.101167.

---. 2023. "Expressions of the political: an exploration of women's infra-politics in artisanal mines in the eastern Democratic Republic of the Congo." *The Journal of Peasant Studies*: 1-21.
Gal, Susan. 1989. "Between speech and silence: The problematics of research on language and gender." *IPrA Papers in Pragmatics* 3 (1): 1-38.
---. 2012. "Language, gender, and power: An anthropological review." In *Gender articulated*, 169-182. Routledge.
Geenen, Sara. 2011a. "Constraints, opportunities and hope: artisanal gold mining and trade in South Kivu (DRC)." In *Natural Resources and Local Livelihoods in the Great Lakes Region of Africa: A Political Economy Perspective*, edited by A. and Marysse Ansoms, S., 192-214. Palgrave Macmillan.
---. 2011b. "Relations and regulations in local gold trade networks in South Kivu, Democratic Republic of Congo." *Journal of Eastern African Studies* 5 (3): 427-446.
---. 2012. "A dangerous bet: The challenges of formalizing artisanal mining in the Democratic Republic of Congo." *Resources policy* 37 (3): 322-330. https://doi.org/10.1016/j.resourpol.2012.02.004.
---. 2014. "Dispossession, displacement and resistance: Artisanal miners in a gold concession in South-Kivu, Democratic Republic of Congo." *Resources policy* 40 (1): 90-99. https://doi.org/10.1016/j.resourpol.2013.03.004.
---. 2015. *African Artisanal Mining from the Inside Out: Access, norms and power in Congo's gold sector.Routledge studies of the extractive industries and sustainable development*. London: Routledge.
Geenen, Sara, and Jeroen Cuvelier. 2019. "Local elites' extraversion and repositioning: Continuities and changes in Congo's mineral production networks." *The Extractive Industries and Society* 6 (2): 390-398.
Geenen, Sara, Gracia Kabilambali, Fiz Mussa Bashizi, and Elisa Vanlerberghe. 2022. "Women who "age too fast": female work, bodies and health in the gold mines of Eastern Democratic Republic of Congo." *The Extractive Industries and Society* 12: 101138.
Geenen, Sara, and Ben Radley. 2014. "In the face of reform: What future for ASM in the eastern DRC?" *Futures : the journal of policy, planning and futures studies* 62: 58-66. https://doi.org/10.1016/j.futures.2013.10.023.
Geertz, Clifford. 2008. "Thick description: Toward an interpretive theory of culture." In *The cultural geography reader*, 41-51. Routledge.
Geissler, P. Wenzel, and Ruth J. Prince. 2020. "'Toxic worldings': Introduction to toxic flows." *Anthropology today.* 36 (6): 3-4. https://doi.org/10.1111/1467-8322.12615.
Gereffi, G., J. Humphrey, R. Kaplinsky, and T. J. Sturgeon. 2001. "Globalisation, value chains and development. Introduction." *IDS bulletin (Brighton. 1984)* 32 (3): 1-8.
Gereffi, Gary, and Miguel Korzeniewicz. 1994. *Commodity chains and global capitalism*. Westport, Conn: Praeger.
Gier, Jaclyn J, and Laurie Mercier. 2006. *Mining women: Gender in the development of a global industry, 1670 to 2005*. Springer.
Godoy, Ricardo. 1985. "Mining: anthropological perspectives." *Annual review of anthropology*: 199-217.
Goffman, Erving. 2023. "The presentation of self in everyday life." In *Social theory re-wired*, 450-459. Routledge.

Gómez-Barris, Macarena. 2017. *The extractive zone: Social ecologies and decolonial perspectives*. Duke University Press.
Goodhand, Jonathan. 2000. "Research in conflict zones: ethics and accountability." *Forced Migration Review* 8 (4): 12-16.
Gouby, Mélanie. 2024. "Rise of the 'mother boss': how female miners are taking control in DRC." The Guardian Last Modified January 19, 2024. Accessed May 14. https://www.theguardian.com/global-development/2024/jan/19/female-miners-mother-boss-drc-congo-annie-sinanduku-mwange.
Grant, Michael P, Nathalie Henley, Marion Dubuissez, Nan Chen, Ursula Hartmann, Virginie Royal, Olivier Barbier, Vincent Pichette, and Casimiro Gerarduzzi. 2022. "Subchronic oral exposure of tungsten induces myofibroblast transformation and various markers of kidney fibrosis." *American Journal of Physiology-Cell Physiology* 322 (2): C205-C217.
Green, Linda. 1994. "Fear as a Way of Life." *Cultural anthropology* 9 (2): 227-256.
---. 1995. "Living in a State of Fear." In *Fieldwork Under Fire: Contemporary studies of violence and survival* edited by Carolyn and Robben Nordstrom, Antonius 105-127. Berkley: University of California Press.
Group, World Bank. 2024a. "The World Bank in Africa ". World Bank Group Accessed 27 January https://www.worldbank.org/en/region/afr/overview#1.
---. 2024b. "The World Bank in DRC ". World Bank Group https://www.worldbank.org/en/country/drc/overview.
---. 2024c. "The World Bank in Rwanda ". World Bank Group Accessed 27 January https://www.worldbank.org/en/country/rwanda/overview.
Habyarimana, Faustin, Temesgen Zewotir, and Shaun Ramroop. 2021. "Structured spatial modeling and mapping of domestic violence against women of reproductive age in Rwanda." *Journal of interpersonal violence* 36 (5-6): 2430-2454.
Hannover, Federal Institute for Geosciences and Natural Resources in. 2023. "Conflict Minerals ". BGR. Accessed 17 March. https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/CTC/Concept_MC/Conflict-Minerals/cmc_conflict_minerals_node_en.html.
Harries, Patrick. 1994. *Work, culture, and identity : migrant laborers in Mozambique and South Africa, c. 1860-1910*.*Social history of Africa*. Portsmouth, N.H: Heinemann.
Hayes, Karen, and Rachel Perks. 2012. "Women in the artisanal and small-scale mining sector of the Democratic Republic of the Congo." *High-value natural resources and peacebuilding*: 529-544.
Hilson, Gavin. 2009. "Small-scale mining, poverty and economic development in sub-Saharan Africa: An overview." *Resources policy* 34 (1): 1-5. https://doi.org/10.1016/j.resourpol.2008.12.001.
---. 2016. "Farming, small-scale mining and rural livelihoods in Sub-Saharan Africa: A critical overview." *The extractive industries and society* 3 (2): 547-563. https://doi.org/10.1016/j.exis.2016.02.003.
Hilson, Gavin, and Roy Maconachie. 2020. "Artisanal and small-scale mining and the Sustainable Development Goals: Opportunities and new directions for sub-Saharan Africa." *Geoforum* 111: 125-141. https://doi.org/10.1016/j.geoforum.2019.09.006.

Hilson, Gavin, and James McQuilken. 2014. "Four decades of support for artisanal and small-scale mining in sub-Saharan Africa: A critical review." *The extractive industries and society* 1 (1): 104-118. https://doi.org/10.1016/j.exis.2014.01.002.
Hinton, Jennifer, Joke Manders, and Katrine Danielsen. 2016. "The Gender Dimensions of Tin, Tantalum and Tungsten Mining in the Greak Lakes Region." 1-75.
Hinton, Jennifer, Marcello M Veiga, and Christian Beinhoff. 2003. "Women and artisanal mining: Gender roles and the road ahead." *The socio-economic impacts of artisanal and small-scale mining in developing countries*: 149-188.
Hochschild, Adam. 1999. *King Leopold's ghost: A story of greed, terror, and heroism in colonial Africa*. Houghton Mifflin Harcourt.
Hönke, Jana. 2010. "New political topographies. Mining companies and indirect discharge in Southern Katanga (DRC)." *Politique africaine* (4): 105-127.
Iguma Wakenge, Claude, Marie-Rose Bashwira Nyenyezi, Sylvia I. Bergh, and Jeroen Cuvelier. 2021. "From 'conflict minerals' to peace? Reviewing mining reforms, gender, and state performance in eastern Democratic Republic of Congo." *The extractive industries and society* 8 (2): 100894. https://doi.org/10.1016/j.exis.2021.100894.
International, Transparency. 2025. "Our Work in Rwanda." Corruption Perceptions Index. Transparency International Accessed 27 January https://www.transparency.org/en/countries/rwanda.
Jacka, Jerry K. 2018. "The anthropology of mining: the social and environmental impacts of resource extraction in the mineral age." *Annual Review of Anthropology* 47 (1): 61-77.
Jackson, Stephen. 2002. "Making a killing: criminality & coping in the Kivu War economy." *Review of African political economy* 29 (93-94): 517-536. https://doi.org/10.1080/03056240208704636.
---. 2006. "Sons of which soil? The language and politics of autochthony in Eastern DR Congo." *African studies review* 49 (2): 95-124.
Jenkins, Katy. 2014. "Women, mining and development: An emerging research agenda." *The extractive industries and society* 1 (2): 329-339. https://doi.org/10.1016/j.exis.2014.08.004.
Jerven, Morten. 2013. *Poor numbers: how we are misled by African development statistics and what to do about it*. Cornell University Press.
Johansson, Anna, and Stellan Vinthagen. 2016. "Dimensions of Everyday Resistance: An Analytical Framework." *Critical sociology* 42 (3): 417-435. https://doi.org/10.1177/0896920514524604.
Johnson-Hanks, Jennifer 2016. "Vital Conjunctures Revisited." In *Vital Conjunctures Revisited: Gender in Times of Uncertainty*, edited by Nadine Sieveking and Lena Dallywater, 6-16. Halle and Leipzig: Universitätsbibliothek Leipzig.
Johnson-Hanks, Jennifer. 2002. "On the limits of life stages in ethnography: Toward a theory of vital conjunctures." *American anthropologist* 104 (3): 865-880.
Junka-Aikio, Laura, and Catalina Cortes-Severino. 2017. Cultural studies of extraction. Taylor & Francis.
Kamundala, Gabriel. 2025. "" ICI ON TRAVAILLE: The role of cooperatives in structuring social relations of production in artisanal and small-scale gold mining in Eastern DRC." *Journal of Rural Studies* 113: 103483.

Kane, Théodore de Kerros and Coumba. 2025. "Fighting in the DRC sparks a surge of sexual violence." Le Monde Last Modified 3 March 2025. Accessed 19 march https://www.lemonde.fr/en/le-monde-africa/article/2025/03/03/fighting-in-the-drc-sparks-a-surge-of-sexual-violence_6738737_124.html.

Katz-Lavigne, Sarah. 2019. "Artisanal copper mining and conflict at the intersection of property rights and corporate strategies in the Democratic Republic of Congo." *The extractive industries and society* 6 (2): 399-406. https://doi.org/10.1016/j.exis.2018.12.001.

Kelly, J. T., T. S. Betancourt, D. Mukwege, R. Lipton, and M. J. Vanrooyen. 2011. "Experiences of female survivors of sexual violence in eastern Democratic Republic of the Congo: A mixed-methods study." *Conflict and health* 5 (1): 25-25. https://doi.org/10.1186/1752-1505-5-25.

Kelly, Jocelyn T. D. 2014. "This mine has become our farmland": Critical perspectives on the coevolution of artisanal mining and conflict in the Democratic Republic of the Congo." *Resources policy* 40 (1): 100-108. https://doi.org/10.1016/j.resourpol.2013.12.003.

Kelly, Jocelyn T. D., Alexandria King-Close, and Rachel Perks. 2014. "Resources and resourcefulness: Roles, opportunities and risks for women working at artisanal mines in South Kivu, Democratic Republic of the Congo." *Futures : the journal of policy, planning and futures studies* 62: 95-105. https://doi.org/10.1016/j.futures.2014.04.003.

King, Elisabeth. 2009. "From data problems to data points: Challenges and opportunities of research in postgenocide Rwanda." *African Studies Review* 52 (3): 127-148.

Lahiri-Dutt, Kuntala. 2011. "The megaproject of mining: a feminist critique." In *Engineering earth*, 329-351. Springer.

Lahiri-Dutt, Kuntala, and Martha MacIntyre. 2016. *Women miners in developing countries : pit women and others*.*Voices in Development Management*. Abingdon, Oxon: Routledge.

Lame, Danielle de. 2005. *A hill among a thousand : transformations and ruptures in rural Rwanda*.*Africa and the diaspora*. Madison: University of Wisconsin Press.

Lefebvre, Henri. 1961. "Critique de la vie quotidienne: fondements d'une sociologie de la quotidienneté (Vol. 2)." *Paris: L'Arche*.

Lemarchand, René. 2009a. *The dynamics of violence in Central Africa*. *National and ethnic conflict in the 21st century*. Philadelphia: University of Pennsylvania Press.

---. 2009b. "Reflections on the Crisis in Eastern Congo." *The Brown journal of world affairs* 16 (1): 119-132.

Lewis, Chloé. 2022. "The making and re-making of the 'rape capital of the world': on colonial durabilities and the politics of sexual violence statistics in DRC." *Critical African Studies* 14 (1): 55-72.

Longman, Timothy. 2013. "Conducting Research in Conflict Zones: Lessons from the African Great Lakes Region." In *Research Methods in Conflict Settings: A view from below* edited by L. A. Gale, K. Jacobsen and D. Mazurana, 254-274. Cambridge: Cambridge University Press.

---. 2023. "Researching under constraints: Recent books on post-genocide Rwanda." *Journal of human rights* 22 (3): 425-430. https://doi.org/10.1080/14754835.2023.2173002.
MacGaffey, Janet. 1986. "'Fending-for-yourself': The organization of the second economy in Zaire." In *The Crisis in Zaire: myths and realities* edited by Georges Nzongola-Ntalaja, 141-156. Trenton, N.J.: Africa World Press.
---. 2019. "Evading male control: women in the second economy in Zaire." In *Patriarchy and Class*, 161-176. Routledge.
MacGaffey, Janet, and Vwakyanakazi Mukohya. 1991. *The real economy of Zaire : the contribution of smuggling and other unofficial activities to national wealth*. London: Currey.
Macháček, Jan, Martin Schlossarek, and Philemon Lindagato. 2022. "The livelihood of artisanal and small-scale miners and awareness of the use of 3T minerals in Rwanda—A case study in the Rutsiro District: A qualitative assessment." *International journal of environmental research and public health* 19 (19): 12570.
Maclin, Beth J., Jocelyn T. D. Kelly, Rachel Perks, Patrick Vinck, and Phuong Pham. 2017. "Moving to the mines: Motivations of men and women for migration to artisanal and small-scale mining sites in Eastern Democratic Republic of the Congo." *Resources policy* 51: 115-122. https://doi.org/10.1016/j.resourpol.2016.12.003.
Mahy, Petra. 2011. "Sex work and livelihoods: Beyond the 'negative impacts on women'in Indonesian mining." *Gendering the field: Towards sustainable livelihoods for mining communities* 6: 49-65.
Makonye, Felix. 2023. "Demystifying March 23 (M23) Rebellion: Case of Eastern Democratic Republic of Congo (DRC)." *African journal of terrorism and insurgency research* 4 (1): 5. https://doi.org/10.31920/2732-5008/2023/v4n1a1.
Makori, Timo. 2024. "A sovereign grant and a franchised state: Tin mineral supply chains in south Kivu of eastern Democratic Republic of Congo." *Anthropological theory* 24 (3): 282-310. https://doi.org/10.1177/14634996241246494.
Mama, Amina. 2011. "What does it mean to do feminist research in African contexts?" *Feminist Review* 98 (1_suppl): e4-e20.
Mantz, Jeffrey W. 2018. "From Digital Divides to Creative Destruction: Epistemological Encounters in the Regulation of the" Blood Mineral" Trade in the Congo." *Anthropological Quarterly* 91 (2): 525-549.
Marcus, George E. 1995. "Ethnography in/of the world system: The emergence of multi-sited ethnography." *Annual review of anthropology* 24 (1): 95-117.
---. 2016. "Multi-Sited Ethnography: Notes and Queries 1." In *Multi-sited ethnography*, 181-196. Routledge.
Maruster, Laura. 2013. *Qualitative research methods*. Sage.
Mathys, Gillian. 2017. "Bringing history back in: past, present, and conflict in Rwanda and the Eastern Democratic Republic of Congo." *The Journal of African History* 58 (3): 465-487.
Maubert, Camille, Jeremy Allouche, Irene Hamuli, Eustache Kuliumbwa Lulego, Gauthier Marchais, Ferdinand M Mugumo, and Sohela Nazneen. 2022. *Women's Agency and Humanitarian Protection in North and South Kivu, DRC*. Institute of Development Studies.

Mazalto, Marie. 2008. "La réforme du secteur minier en République démocratique du Congo: enjeux de gouvernance et perspectives de reconstruction." *Afrique contemporaine* (3): 53-80.
McCulloch, Jock. 2012. *South Africa's Gold Mines and the Politics of Silicosis*. 1 ed. Vol. 30.*African issues*. United Kingdom: Boydell & Brewer.
Meger, Sara. 2010. "Rape of the Congo: Understanding sexual violence in the conflict in the Democratic Republic of Congo." *Journal of contemporary African studies* 28 (2): 119-135. https://doi.org/10.1080/02589001003736728.
Mercier, Laurie, and Jaclyn Gier. 2007. "Reconsidering Women and Gender in Mining." *History compass* 5 (3): 995-1001. https://doi.org/10.1111/j.1478-0542.2007.00398.x.
Merrill, Adam M. . 2023. 2018 Minerals Yearbook: Tin edited by The United States Geological Survey.
Minyati, Tristan. 2024. "Rwanda's bold new mining law sets stage for mineral boom ". Accessed 27 January https://www.newtimes.co.rw/article/19929/opinions/rwandas-bold-new-mining-law-sets-stage-for-mineral-boom.
Mishra, Prajna Paramita, Ch Sravan, and Sujit Kumar Mishra. 2024. "Extracting empowerment: A critical review on violence against women in mining and mineral extraction." *Energy Research & Social Science* 109: 103414.
Mohanty, C. 1988. "Under Western Eyes: Feminist Scholarship and Colonial Discourses." *Feminist review* (30): 61-88. https://doi.org/10.2307/1395054.
Moodie, T. Dunbar, and Vivienne Ndatshe. 1994. *Going for gold : men, mines, and migration*.*Perspectives on Southern Africa ; 51*. Johannesburg: Witwatersrand University Press.
Moore, Jason W., Elmar Altvater, Eileen C. Crist, Donna J. Haraway, Daniel Hartley, Christian Parenti, and Justin McBrien. 2016. *Anthropocene or Capitalocene?: Nature, History, and the Crisis of Capitalism*. Oakland: PM Press.
Mugo, David, Florence Ondieki-Mwaura, and Miriam Omolo. 2020. "The social-cultural context of women participation in artisanal and small-scale mining: Case of Taita Taveta region of Kenya." *African Journal of Emerging Issues* 2 (5): 21-30.
Muhindo, Kizito Sabala and Vyalirendi Jacques. 2025. "The East African Community Regional Force in the Democratic Republic of the Congo: Successes, Challenges and Prospects " *African Journal on Conflict Resolution* 3. https://www.accord.org.za/ajcr-issues/the-east-african-community-regional-force-in-the-democratic-republic-of-the-congo-successes-challenges-and-prospects/.
Munir, Laine. 2022. "Do Cooperatives Improve Female Miners' Outcomes? A Case Study of Rwanda." *The Journal of development studies* 58 (11): 2349-2365. https://doi.org/10.1080/00220388.2022.2086048.
---. 2023. "Women and changing sociolegal landscapes in Rwandan mining formalization." *Journal of Rural Studies* 97: 167-176.
Murrey, Amber. 2015. "Invisible power, visible dispossession: The witchcraft of a subterranean pipeline." *Political Geography* 47: 64-76.
Murrey, Amber, and Sharlene Mollett. 2023. "Extraction is not a metaphor: Decolonial and Black Geographies against the gendered and embodied violence of

extractive logics." *Transactions - Institute of British Geographers (1965)* 48 (4): 761-780. https://doi.org/10.1111/tran.12610.
Mususa, Patience. 2010. "Contesting illegality: Women in the informal copper business." In *Zambia, mining, and neoliberalism: Boom and bust on the globalized copperbelt*, edited by Ann and Chipeta Schlyter, Lucy, 185-208. Stockholm: Springer.
---. 2021. *There used to be order: Life on the Copperbelt after the privatisation of the Zambia Consolidated Copper Mines*. University of Michigan Press.
Nadar, Sarojini. 2014. ""Stories are data with Soul" - lessons from black feminist epistemology." *Agenda (Durban)* 28 (1): 18-28. https://doi.org/10.1080/10130950.2014.871838.
Nash, June C. 1993. *We eat the mines and the mines eat us: Dependency and exploitation in Bolivian tin mines*. Columbia University Press.
Nencel, Lorraine. 2014. "Situating reflexivity: Voices, positionalities and representations in feminist ethnographic texts." Women's Studies International Forum.
Nest, Michael Wallace. 2011. *Coltan*. *Polity resources*. Cambridge: Polity.
Newbury, Catharine. 1998. "Ethnicity and the Politics of History in Rwanda." *Africa Today* 45 (1): 7-24.
Nixon, Rob. 2011. *Slow Violence and the Environmentalism of the Poor*. Harvard University Press.
Nkomo, Melusi. 2025. "'Small gold and small grain': social reproduction, labour exchanges, and dependencies in Zimbabwe's resettlement areas." *The Journal of Peasant Studies* 52 (4): 856-877.
Nordstrom, Carolyn, and Antonius C. G. M. Robben. 1995. *Fieldwork under fire : contemporary studies of violence and survival*. Berkeley: University of California Press.
Nsanzimana, Bernard, Aline Providence Nkundibiza, and Patricie Mwambarangwe. 2022. "Promoting gender equality in the Rwandan ASM: Efforts and obstacles." In *The (In) Visibility of Women and Mining*, 116-135. Routledge.
Nzongola-Ntalaja, Georges. 2013. *The Congo from Leopold to Kabila: a people's history*. Bloomsbury Publishing.
Ochs, Elinor, and Lisa Capps. 1996. "Narrating the self." *Annual review of anthropology* 25 (1): 19-43. https://doi.org/10.1146/annurev.anthro.25.1.19.
---. 2009. *Living narrative: Creating lives in everyday storytelling*. Harvard University Press.
Ofosu, George, Andreas Dittmann, David Sarpong, and David Botchie. 2020. "Socio-economic and environmental implications of Artisanal and Small-scale Mining (ASM) on agriculture and livelihoods." *Environmental science & policy* 106: 210-220. https://doi.org/10.1016/j.envsci.2020.02.005.
Ofosu, George, David Sarpong, Mabel Torbor, and Shadrack Asante. 2024. "'Mining women' and livelihoods: Examining the dominant and emerging issues in the ASM gendered economic space." *Economic and industrial democracy* 45 (4): 1213-1241. https://doi.org/10.1177/0143831X231212562.
Ortner, Sherry B. 2006. *Anthropology and social theory : culture, power, and the acting subject*. Durham: Duke University Press.

Østby, Gudrun. 2016. "Violence begets violence: Armed conflict and domestic sexual violence in sub-Saharan Africa." SVAC (Sexual Violence and Armed Conflict) Workshop, Harvard University, Cambridge.
Oyěwùmí, Oyèrónké 1997. *The Invention of Women: Making an African Sense of Western Gender Discourses*. NED - New edition ed. Minneapolis: University of Minnesota Press.
Paschal, Makungu, and Jignesh Kauangal. 2023. "Women position in artisanal and small-scale mining in Sub-Saharan Africa: A systematic literature review." *Resources Policy* 81: 103314.
Peacekeeping, United Nations. 2025. "MONUSCO Fact Sheet." United Nations. Accessed 19 March. https://peacekeeping.un.org/en/mission/monusco.
Pearsall, Judy. 2001. *The concise Oxford dictionary*. 10th rev. ed. Oxford ; Cape Town: Oxford University Press.
Perks, Rachel. 2013. "Digging into the past: critical reflections on Rwanda's pursuit for a domestic mineral economy." *Journal of Eastern African studies* 7 (4): 732-750. https://doi.org/10.1080/17531055.2013.841025.
---. 2014. "Mining, Security and Development in Rwanda: critical reflections on the past, present and future." PhD, University of Reading.
---. 2016. "Re-framing the nature and success of the “post-conflict” mineral reform agenda in Rwanda." *The Extractive Industries and Society* 3 (2): 329-339.
Peterman, Amber, Tia Palermo, and Caryn Bredenkamp. 2011. "Estimates and determinants of sexual violence against women in the Democratic Republic of Congo." *American journal of public health* 101 (6): 1060-1067.
Pizio, Anthony Di. 2024. "How much profit is hiding within Tesla’s enormous $78 billion in automotive revenue?". Yahoo Finance. Last Modified February 8, 2024. Accessed March 3. https://finance.yahoo.com/news/much-profit-hiding-within-teslas-112200420.html?guccounter=1.
Plumwood, Val. 2008. "Shadow places and the politics of dwelling." *Australian Humanities Review* 44 (2): 139-150.
Polsky, Ned. 2017. *Hustlers, beats, and others*. Routledge.
Postma, Hester, Sara Geenen, and Lena Partzsch. 2021. "Digging for due diligence: The case of non-state mineral supply chain regulation by ITSCI in Rwanda." *The Extractive Industries and Society* 8 (3): 100920.
Programme, United Nations Development, and Oxford Poverty and Human Development Initiative. 2023. *Global Multidimensional Poverty Index 2023*. https://hdr.undp.org/system/files/documents/hdp-document/2023mpireporten.pdf.
Prunier, Gérard. 2009. *Africa's world war : Congo, the Rwandan genocide, and the making of a continental catastrophe*. New York: Oxford University Press.
Pugliese, Francesca. 2021. "Mining companies and gender(ed) policies: The women of the Congolese Copperbelt, past and present." *The extractive industries and society* 8 (3): 100795. https://doi.org/10.1016/j.exis.2020.08.006.
Raeymaekers, Timothy, Ken Menkhaus, and Koen Vlassenroot. 2008. "State and non-state regulation in African protracted crises: governance without government?" *Afrika focus* 21 (2): 7-21.
Ranganathan, Meghna, Catherine MacPhail, Audrey Pettifor, Kathleen Kahn, Nomhle Khoza, Rhian Twine, Charlotte Watts, and Lori Heise. 2017. "Young women’s

perceptions of transactional sex and sexual agency: a qualitative study in the context of rural South Africa." *BMC public health* 17: 1-16.
Rasmussen, Mattias Borg, and Christian Lund. 2018. "Reconfiguring Frontier Spaces: The territorialization of resource control." *World development* 101: 388-399. https://doi.org/10.1016/j.worlddev.2017.01.018.
Razavi, Shahra. 2013. "Households, families, and social reproduction." In *The Oxford handbook of gender and politics*, edited by Karen Celis Georgina Waylen, Johanna Kantola, S. Laurei Weldon, 289-312. New York, NY: Oxford University Press.
Rees, David, and Jill Murray. 2020. "Silica, silicosis and tuberculosis." *Occupational Health Southern Africa* 26 (5): 266-276.
Reyntjens, Filip. 2009. *The Great African War: Congo and Regional Geopolitics, 1996–2006*. 1 ed. New York: Cambridge University Press.
---. 2011. "Constructing the truth, dealing with dissent, domesticating the world: Governance in post-genocide Rwanda." *African Affairs* 110 (438): 1-34.
---. 2015. "War in the Great Lakes region." In *Africa in world politics: Engaging a changing global order*, edited by Harbeson J. W. and Rothchild D. United States: Westview Press.
---. 2020. *Political Chronicles of the African Great Lakes Region 2019= Chroniques Politiques de L'Afrique des grands Lacs 2019*. ASP editions-Academic and Scientific Publishers.
Ross, Fiona. 2003. "On having voice and being heard: some after-effects of testifying before the South African Truth and Reconciliation Commission." *Anthropological Theory* 3 (3): 325-341.
---. 2010. "An Acknowledged Failure: Women, Voice, Violence, and the South African Truth and Reconciliation Commission " In *Localizing Transitional Justice: Interventions and Priorities After Mass Violence*, edited by Rosalind Shaw, and Waldorf, Lars, 69-91. Stanford, California: Stanford University Press.
Rubbers, Benjamin. 2015. "When Women Support the Patriarchal Family: The Dynamics of Marriage in a Gécamines Mining Camp (Katanga Province, DR Congo)." *Journal of historical sociology* 28 (2): 213-234. https://doi.org/10.1111/johs.12050.
---. 2019. "Mining towns, enclaves and spaces: A genealogy of worker camps in the Congolese copperbelt." *Geoforum* 98: 88-96.
Rushemuka, Maxime Ndanyuzwe, and Muriel Côte. 2024. "Artisanal and small-scale mining through a “labour regime” lens: consolidating a research agenda on labour exploitation." *Journal of Rural Studies* 105: 103189.
Rustad, Siri Aas, Gudrun Østby, and Ragnhild Nordås. 2016. "Artisanal mining, conflict, and sexual violence in Eastern DRC." *The extractive industries and society* 3 (2): 475-484. https://doi.org/10.1016/j.exis.2016.01.010.
Rutherford, Blair. 2020. "The Moral Politics of Gendered Labour in Artisanal Mining in Sierra Leone." *Development and change* 51 (3): 771-793. https://doi.org/10.1111/dech.12584.
Rutherford, Blair, and Laila Chemane-Chilemba. 2020. "The governance of artisanal and small-scale mining in Manica District, Mozambique: implications for women's livelihoods." *Canadian journal of African studies* 54 (1): 139-156. https://doi.org/10.1080/00083968.2019.1671206.

Rwanda Mines, Petroleum and Gas Board. 2022. Gender strategy for the mining sector in Rwanda edited by Petroleum and Gas Board Rwanda Mines.
Scheper-Hughes, Nancy. 1992. *Death without weeping: The violence of everyday life in Brazil*. Univ of California Press.
Schouten, Peer. 2019. "Roadblock politics in Central Africa." *Environment and planning. D, Society & space* 37 (5): 924-941. https://doi.org/10.1177/0263775819830400.
Schulz, Klaus J., Piatak, Nadine M., and Papp, John F. . 2017. Niobium and Tantalum edited by United States Geological Survey. Reston, Virginia
Schumaker, Lyn. 2001. *Africanizing anthropology : fieldwork, networks, and the making of cultural knowledge in central Africa*. Durham [N.C: Duke University Press.
Schütte, Philip, and Uwe Näher. 2020. "Tantalum supply from artisanal and small-scale mining: A mineral economic evaluation of coltan production and trade dynamics in Africa's Great Lakes region." *Resources Policy* 69: 101896.
Scott, James. 1987. *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press.
Scott, James C. 1992. *Domination and the arts of resistance: hidden transcripts*. Place of publication not identified: Yale University Press.
Shedd, Kim B. . 2022. 2018 Minerals Yearbook: Tungsten edited by The United States Geological Survey.
Simmel, Georg, David Frisby, Tom Bottomore, and Charles Lemert. 2011. *The philosophy of money*. Routledge.
Sluka, Jeffrey A. 1995. "Reflections on managing danger in fieldwork: Dangerous anthropology in Belfast." In *Fieldwork under Fire. Contemporary Studies of Violence and Survival* edited by Carolyn Nordstrom and Antonius Robben, 276-294. Berkeley: University of California Press.
Smith, James. 2015. ""“May it never end” Price wars, networks, and temporality in the “3 Ts” mining trade of the Eastern DR Congo." *HAU: Journal of Ethnographic Theory* 5 (1): 1-34.
---. 2021. *The Eyes of the World: Mining the Digital Age in the Eastern DR Congo*. 1 ed. Chicago: The University of Chicago Press.
Spivak, Gayatri Chakravorty. 2000. "Translation as culture." *parallax* 6 (1): 13-24.
---. 2015. "Can the Subaltern Speak?" In *Colonial discourse and post-colonial theory*, 66-111. Routledge.
Stearns, Jason K. 2022. *The War That Doesn't Say Its Name: The Unending Conflict in the Congo*. 1st ed. United States: Princeton University Press.
Stewart, Jennifer, Richard Kibombo, and L. Pauline Rankin. 2020. "Gendered livelihoods in the artisanal mining sector in the Great Lakes Region." *Canadian journal of African studies* 54 (1): 37-56. https://doi.org/10.1080/00083968.2019.1689831.
Straus, Scott, and Lars Waldorf. 2011. *Remaking Rwanda: State building and human rights after mass violence*. Univ of Wisconsin Press.
Szeman, Imre, and Jennifer Wenzel. 2021. "What do we talk about when we talk about extractivism?" *Textual Practice* 35 (3): 505-523.
Taussig, Michael T. 1992. *The nervous system*. New York: Routledge.
Taylor, Christopher C. 1992. *Milk, honey, and money : changing concepts in Rwandan healing*.*Smithsonian series in ethnographic inquiry.* Washington: Smithsonian Institution Press.

Thomson, Susan. 2009. "'That is not what we authorised you to do…': Access and government interference in highly politicised research environments." In *Surviving field research*, 120-136. Routledge.
---. 2011. "Reeducation for reconciliation: Participant Observation on *Ingando*." In *Remaking Rwanda: State building and human rights after mass violence*, edited by Scott Straus and Lars Waldorf, 331-353. Madison: The University of Wisconsin Press.
---. 2013. "Academic integrity and ethical responsibilities in post-genocide Rwanda: working with research ethics boards to prepare for fieldwork with 'human subjects'." In *Emotional and ethical challenges for field research in Africa: The story behind the findings*, 139-154. Springer.
Titeca, Kristof, and Tom de Herdt. 2011. "Real governance beyond the 'failed state': Negotiating education in the Democratic Republic of the Congo." *African affairs (London)* 110 (439): 213-231. https://doi.org/10.1093/afraf/adr005.
Titeca, Kristof, and Tom de Herdt. 2010. "Regulation, Cross-border Trade and Practical Norms in West Nile, North-Western Uganda." *Africa (London. 1928)* 80 (4): 573-594. https://doi.org/10.3366/afr.2010.0403.
Trefon, Theodore. 2016. *Congo's environmental paradox: Potential and predation in a land of plenty*. Vol. 12.*African arguments*. London: NBN International.
Tsing, Anna. 2003. "Natural resources and capitalist frontiers." *Economic and Political Weekly*: 5100-5106.
---. 2005. "How to make resources in order to destroy them (and then save them?) on the salvage frontier." *Histories of the Future*: 53-73.
---. 2009. "Supply chains and the human condition." *Rethinking marxism* 21 (2): 148-176.
Turner, Thomas. 2007. *The Congo wars: conflict, myth and reality*. Zed Books.
Umubyeyi, Aline, Ingrid Mogren, Joseph Ntaganira, and Gunilla Krantz. 2014. "Women are considerably more exposed to intimate partner violence than men in Rwanda: results from a population-based, cross-sectional study." *BMC women's health* 14: 1-12.
UNDP. 2024a. "Human Development Reports: Congo (Democratic Republic of the)." Unitted Nations Development Programme. Accessed 27 January https://hdr.undp.org/data-center/specific-country-data#/countries/COD.
---. 2024b. "Human Development Reports: Rwanda." United Nations Development Programme. Accessed 27 January https://hdr.undp.org/data-center/specific-country-data#/countries/RWA.
USGS. 2022. "What is a critical mineral? ." The United States Geological Survey Last Modified July 2, 2025. Accessed July 10. https://www.usgs.gov/faqs/what-a-critical-mineral.
Uwizeyimana, Laurien. 1988. *L'activité minière au Rwanda : d'une exploitation marginale à l'effondrement*. Bordeaux: CRET, Université de Bordeaux III.
Van Reybrouck, David, and Sam Garrett. 2014. *Congo : the epic history of a people*. London: Fourth Estate.
Venuti, Lawrence. 2012. *Translation changes everything: Theory and practice*. Routledge.
Verbruggen, Didier, Evie Francq, and Jeroen Cuvelier. 2011. *Guide to current mining reform initiatives in eastern DRC*. International Peace Information Service (IPIS).

Verweijen, Judith, Matthew Himley, and Tomas Frederiksen. 2024. "Unearthing extractive subjects: Power and subjectivity at the extractive frontier." *Geoforum* 148: 103917. https://doi.org/10.1016/j.geoforum.2023.103917.
Vigh, Henrik. 2009. "Motion squared: A second look at the concept of social navigation." *Anthropological theory* 9 (4): 419-438.
Vlassenroot, Koen. 2006. "War and social research. the limits of empirical methodologies in war-torn environments." *Civilisations. Revue internationale d'anthropologie et de sciences humaines* (54): 191-198.
---. 2013. "Dealing with land issues and conflict in eastern Congo: towards an integrated and participatory approach." *AFRICA POLICY BRIEFS* (4): 1-5.
Vlassenroot, Koen, and Chris Huggins. 2005. "Land, migration and conflict in eastern DRC." *From the ground up: land rights, conflict and peace in sub-Saharan Africa*: 115-194.
Vlassenroot, Koen, and Timothy Raeymaekers. 2009. "Kivu's intractable security conundrum." *African Affairs* 108 (432): 475-484.
Vogel, Christoph. 2018. "Between Tags & Guns: Fragmentations of public authority around eastern Congo's artisanal 3T mines." *Political geography* 63: 94-103. https://doi.org/10.1016/j.polgeo.2017.06.012.
---. 2022. *Conflict Minerals, Inc.: War, Profit and White Saviourism in Eastern Congo*. Oxford University Press.
Vogel, Christoph, and Josaphat Musamba. 2017. "Brokers of crisis: the everyday uncertainty of Eastern Congo's mineral négociants." *The Journal of modern African studies* 55 (4): 567-592. https://doi.org/10.1017/S0022278X1700043X.
Vogel, Christoph, Josaphat Musamba, and Ben Radley. 2018. "A miner's canary in eastern Congo: Formalisation of artisanal 3T mining and precarious livelihoods in South Kivu." *The extractive industries and society* 5 (1): 73-80. https://doi.org/10.1016/j.exis.2017.09.003.
Volkova, Elizaveta. 2019. "Failed Fieldwork in Senegal: Give Up or Continue?" *The Politics of Conducting Research in Africa: Ethical and Emotional Challenges in the Field*: 153-169.
Wacquant, Loïc J. D. 1998. "Negative social capital: State breakdown and social destitution in America's urban core." *Journal of housing and the built environment* 13 (1): 25-40. https://doi.org/10.1007/BF02496932.
Wakenge, Claude Iguma, Dennis Dijkzeul, and Koen Vlassenroot. 2018. "Regulating the old game of smuggling? Coltan mining, trade and reforms in the Democratic Republic of the Congo." *The Journal of modern African studies* 56 (3): 497-522. https://doi.org/10.1017/S0022278X18000332.
Watch, Human Rights. 2023. "Rwanda: Suspicious Death of Investigative Journalist ". Human Rights Watch Accessed 12 February https://www.hrw.org/news/2023/01/20/rwanda-suspicious-death-investigative-journalist.
Werthmann, Katja. 2009. "Working in a boom-town: Female perspectives on gold-mining in Burkina Faso." *Resources policy* 34 (1-2): 18-23.
Witness, Global. 2022. *The ITSCI Laundromat: How a due diligence scheme appears to launder conflict minerals* (Global Witness).
Wolf, Diane L. 2018. *Feminist dilemmas in fieldwork*. Routledge.

Wolters, Stephanie. 2024. "What are the South Africans doing in Eastern DRC? ." South African Institute of International Affairs. Accessed 19 March. https://saiia.org.za/research/what-are-the-south-africans-doing-in-eastern-drc/.
Yager, Thomas R. . 2019. The Mineral Industry of Congo (Kinshasa). edited by United States Geological Survey.
Yuval-Davis, Nira. 2006. "Intersectionality and Feminist Politics." *The European journal of women's studies* 13 (3): 193-209. https://doi.org/10.1177/1350506806065752.
Zhouri, Andréa. 2017. "Introduction - Anthropology and Knowledge Production in a 'Minefield'." *Vibrant : virtual Brazilian anthropology* 14 (2). https://doi.org/10.1590/1809-43412017v14n2p072.

APPENDICES

Appendix 1: Full list of participants

Name	Age	Type of Work	Income (USD)	Country	Marital Status	Number of Children
Dana	30	Mine Worker	$1-2 per day $30-60 monthly	Rwanda	Separated	2
Natalie	30	Mine Worker	$1-3.50 per day	DRC	Married	5
Rosalie	30	Mine Worker	Unknown	DRC	Married	4
Sarah	22	Mine Worker	unknown	Rwanda	Not married	0
Emily	32	Mine Worker	$60 per month	Rwanda	Not married	1
Mireille	65	Mine Worker	$1 per day	DRC	Divorced	7
Huguette	50	Mine Worker	$2.50-5 per day	DRC	Widow	8
Laura	22	Mine Worker	$5-6 per day	DRC	Married	3
Liliane	30	Mine Worker	$1 - $2 per day	DRC	Married	6
Celeste	63	Mine Worker	Unknown	Rwanda	Widow	2
Alice	22	Mine Worker	$3-6 per week	DRC	Not married	2
Kim	27	Mine Worker	$60 per month	Rwanda	Not married	1
Pascale	27	Mine worker	$25 per week/$100 per month	DRC	Married	1
Bernadette	32	Mine worker	$250-$500 per month	DRC	Married	4
Josephine	34	Mine Worker: Team Leader	$63-$78 per month	Rwanda	Married	4
Gloria	37	Mine Worker: Team Leader	$110 per month	Rwanda	Married	3
Karen	33	Mine Worker (specialty position)	$615 per month	Rwanda	Married	1
Lisa	31	Mine Worker (specialty position)	$460 per month	Rwanda	Married	1
Audrey	25	Mine Worker (specialty position)	$220 per month	Rwanda	Not married	0
Hélène	42	Subcontracted company owner	$785 per month	Rwanda	Married	2
Sylvie	44	subcontractor company owner	$785-$1185 per month	Rwanda	Married	4
Madelaine	61	Cooperative Founder and Director	$80 - $784 per month	Rwanda	Never married	3
Camille	50	Mine Owner	$2360 per month	Rwanda	Married	4
Elise	47	Mine Owner	Unknown	Rwanda	Married	3
Danielle	33	Mineral Transport	$315 per month	Rwanda	Married	2
Jessica	26	Export House Worker	$120 per month	Rwanda	Married	1
Rachel	35	Restaurant Owner on export route	unknown	Tanzania	Widow	4

Appendix 2: Summary of mine site governance and authorities in this study

Authority Body	*Description*	*State*	*Non-State*	*DRC*	*Rwanda*
Traceability Implementors (ITSCI & BM)	Ensures conflict-free mineral sourcing	χ	√	√	√
Private Mining Companies	Lease the mineral exploitation rights to concessioned areas	χ	√	√	√
Subcontracted Companies & Cooperatives	Independent companies that supply formal labour (workers) to private mining companies	χ	√	χ	√
Workers Collectives	A workers association meant to protect mine workers	χ	√	√	√
Government Authorities	State agencies responsible for governing and upholding the law in mineral extraction, processing and trade	√	χ	√ Ministry of Mines Mining Branch Mine Police SAEMAPE[36]	√ Rwanda Mines, Petroleum and Gas Board
Traditional Authorities	Involved in general mine site governance and community relations	χ	√	√	χ

[36] Service d'Assistance et d'Encadrement des Mines Artisanales et à Petite Échelle: Government body responsible for technical assistance at mine sites.

Appendix 3: Most relevant factors that make women's labour illegal following formal legal frameworks and mandatory traceability measures (applied across both countries).

Markers of illegality		
Rwanda	**DRC**	**Traceability Guidelines**
• Mines operating without a government licence • Conducting mine work without formal employment with a company or subcontracted company • Mines operating with children present • Children carrying out mine work • Not following traceability measures	• Mines operating without a government licence • Mining or trading without a permit • Mining in unvalidated sites • Mining or processing minerals while pregnant • Mines operating with children present • Children carrying out mine work • Not following traceability measures	• Mixing minerals from validated and unvalidated sites • Not tagging minerals • Acquiring and using fraudulent tags • Mining where armed groups are present • Mines operating with child labour