The Impact of Informal and Rural Labour Markets on Poverty Reduction:

A Mixed Methods Study of Artisanal and Small-Scale Gold Mining (ASGM) in Northwest Tanzania

Julian Manuel Götz

Thesis submitted for the degree of PhD in Economics

2021

Department of Economics
SOAS, University of London

Acknowledgments

This thesis is the outcome of a long learning experience to which many friends, colleagues, and institutions have contributed in different ways. This space serves to thank those who have been especially important during this process, although I am indebted to many more.

My heartfelt thank you goes to all respondents in Nyarugusu and Mgusu for dedicating some of their precious time to answering not only a survey, which must have seemed odd at many times, but also for openly speaking about their lives and views during the interviews. This thesis would not have been possible without you, and your voices and stories will stay with me for the rest of my life. I am also deeply indebted to all the other interviewees across Tanzania who shared their views with me. Thank you!

Without Aloyce Seni's research assistance this thesis would not have been possible. I am deeply grateful for all the conversations and the time we shared in Nyarugusu, Mgusu, and Dar es Salaam. I will never forget the long days and countless hours we spent surveying and interviewing together, the daily ndizi for lunch, and oh do I admire your optimism and dedication. Thank you for providing me with a home during my second stay in Dar es Salaam, and for being the greatest friend during fieldwork, and afterwards, I could have asked for!

I consider myself very fortunate to have been guided by an excellent supervisor and person. Thank you, Matteo for the immaculate supervision of my work and much beyond. Your academic rigour and constructive criticism as well as your critical approach to political economy and development studies were of great value to this thesis. Your advice hopefully helped me to develop a truly progressive understanding of social science research. Thanks for teaching me so much!

The field research for this PhD was only possible thanks to the warm welcome, hospitality, and supportive environment at REPOA and their support of my visits to Tanzania. In particular, I want to thank Blandina Kilama, Jamal Msami, Cornel Jahari, Enock Anaeli, Amani Sanga, and many more who all welcomed me with open arms and were of great help during my research stay. Also, thanks for letting me present my research in your seminar series. Moreover, I would like to thank the Tanzanian Commission for Science and Technology, who formally acknowledged this research and provided me with the necessary clearances to conduct research in Tanzania.

A very special thank you goes to my friends and colleagues at SOAS. In particular, I want to thank Julian for the time we shared together in Tanzania, for sharing his place with me, and for the fun times and discussions we had. Dear Julia, you became a great friend, were always there when needed, and it was great to be on this academic adventure with you. Thanks for this! I also want to thank Shehryar, Mattia, Glennie, Caroline, Bruno, Sebastian, Pedro, Ahmed, Alkim, and many more, for the conversations and the light-hearted times we had at the IOE, the SOAS bar, and everywhere else.

The support of my friends and family in Germany, despite the distance, was equally important for the completion of this work. A heartfelt thank you goes to you, Nepomuk, for always listening when I needed to share my ideas to acquire confidence in them and for everything else. Moritz, Jasmin, Mathias, Sebastian, Jonathan, and many others, all of you were of great help in very different ways during these last four years. A big thank you! In particular, I want to thank my parents, sister, and grandparents for their unconditional support, trust, and love. Each one of you was utterly important for completing this thesis!

Most importantly, I want to thank my partner and best friend. Johanne, you have supported me from beginning to end and we went through everything together. I cannot thank you enough for your relentless support, love, and serenity. You encouraged me many times, and challenged me more than once, to make this thesis truly mixed-methods and to dig deeper in my qualitative data. For all the ways in which your traces and thoughts surface in this work, I want to thank you from the bottom of my heart. I know that nobody is happier than you to see this work come to fruition!

Finally, this thesis would not have been possible without the financial support of a number of institutions. The German Academic Exchange Service kindly funded the first year of my PhD research. Subsequently, the Hans Böckler Foundation generously supported me with a full scholarship. In addition, two research grants awarded by SOAS and the British Institute in Eastern Africa, helped to foot my fieldwork expenses. For all their support, I am deeply grateful.

Although the thesis would not have been possible without the insights and help of all of these persons, institutions, and funding bodies, all conclusions and shortcomings in it are my sole responsibility.

Abstract

This thesis explores labour markets, their importance to rural non-farming income-generating activities in Sub-Saharan Africa, and the ways in which they affect poverty outcomes of artisanal and small-scale gold mining (ASGM). It engages critically with both the literature portraying ASGM as a sector with the potential for poverty reduction and the scholarship claiming that rural labour markets are dominated by self-employment. By contrast, this thesis's main argument is that the type of ASGM job and employment status translates into heterogeneous poverty outcomes and that this has been underexplored to date. Adopting a comparative case study format, it answers the question for whom ASGM works, and for whom it does not, by presenting and analysing qualitative and quantitative primary data collected during five months of fieldwork in Tanzania, drawing on political economy analysis.

Survey and interview data show that ASGM households do not fare better than their non-mining counterparts, and that poverty rates in 2019 are as high as reported by a previous study in the same area in 2004. Distinct ASGM jobs and employment statuses translate into heterogeneous poverty outcomes. Waged and processing activities feature much lower incomes than the higher average incomes reported by previous contributions. Both findings are important, because two-thirds of the sampled ASGM labour force engage in waged labour and one-third in processing tasks. Questioning the picture of a homogeneous sector, the thesis calls for a more nuanced view of ASGM's ability to reduce poverty. In so doing, it emphasises the need to examine labour markets, and their political economy, in a more inclusive fashion. By reporting substantial levels of waged ASGM activities, this thesis speaks to empirical literature challenging the orthodox assumption of self-employment as the main and only informal employment status. Lastly, this thesis aims to contribute to the broader debate on formalisation by highlighting that incorporating organisational practices as well as understanding labour structures and dynamics is of paramount importance.

Table of Contents

Acknowledgments 3

Abstract 5

Table of Contents 6

List of Figures 9

List of Tables 10

Acronyms and Abbreviations 12

Introduction 15

1 From Macro to Micro: The 'Resource Curse' Debate and Zooming In on ASM 24

1.1 The Macro Perspective on Abundant Natural Resources and Their Effects on Development: Changing Arguments Over Time 25

1.2 Empirics: From Cross- to Sub-National Evidence 32

1.3 Unpacking the Shortcomings of Quantitative Studies: The Neglect of Politics and Questionable Assumptions 38

1.4 Artisanal and Small-Scale Mining and its Effects on Poverty 43

1.4.1 Changing Scholarly Debates 43

1.4.2 ASM and its Local Effects on Poverty: Zooming In on Tanzania 47

2 Rural Labour Markets: An Entry Point to Analyse ASM's Impact on Poverty 50

2.1 Labour Market Theory 51

2.2 Rural and Informal Labour Markets: Contrasting Truths 54

2.3 Empirical Evidence on Rural Labour Markets From Small, Context-Specific Surveys 59

2.4 Tanzania's ASM Labour Markets 63

2.5 Outlining the Research Gap 72

3 Methodology: Mixed Methods and Interdisciplinarity 76

3.1 Research Question(s) and Hypotheses 76

3.2 The Commensurability of Distinct Research Methods 78

3.3 Research Design 82

3.3.1 Quantitative Research: Designing a Context-Specific Household Survey With Special Reference to Labour Relations 82

3.3.2 Qualitative Research: Semi-Structured Interviews 88

3.3.3 Selecting the Case Study Sites 90

4 The Research's Key Concepts and Their Operationalisation 94

4.1 Exploring Theorisations of Economic Informality: Do They Keep Up With Reality on the Ground? 94

4.2 Defining the Household, and Considerations Arising 99

4.3 Measuring Poverty – Linking Survey Evidence to a Respondent-Based Approach 103

4.4 Political Economy and Theoretical Framework 112

5 Embedding the Study in Tanzania's Political Economy of Mining Over the Course of History 114

5.1 German and British Colonisation: State Control and a Mushrooming, Heterogeneous ASM Sector 115

5.2 A Nationalised Mining Sector Under Julius Nyerere 129

5.3 The Liberalisation of Tanzania's Mining Codes 133

***5.3.1 Bulyanhulu: Displacement, Violence, and Government Manoeuvring* 138**

5.4 Kikwete's Turn Towards a Dual LSM Strategy 140

5.5 Magufuli's Mining Policies: Resource Sovereignty Regained – But What is In It for the Average ASM Worker? 143

5.6 Conclusion 152

6 Empirical Framework: Zooming In on ASGM in Nyarugusu and Mgusu 156

6.1 Methodological Choices and Logistics on Site 157

***6.1.1 Creating a Sampling Frame From Scratch* 158**

***6.1.2 Stratification* 159**

***6.1.3 Randomly Selecting Households on the Ground: The Role of Local Gatekeepers, Interview Settings, and Possible Bias* 160**

***6.1.4 The Role of the Research Assistant* 164**

6.2 Livelihoods in Nyarugusu and Mgusu 166

***6.2.1 Sample and Household Demographics* 166**

***6.2.2 Living Arrangements and Access to Basic Infrastructure* 173**

***6.2.3 Mapping Livelihood Activities* 176**

6.3 Conclusion 178

7 Poverty and the Role of ASGM 180

7.1 Measuring Poverty: Quantitative Indicators 181

***7.1.1 Deficiencies of Money- and Asset-Based Poverty Measures* 181**

***7.1.2 Poverty Lines* 184**

***7.1.3 Vulnerability* 192**

***7.1.4 Asset Ownership* 196**

***7.1.5 Asset Index* 200**

7.2 Adding Meaning: Qualitative Evidence on Poverty **204**
7.3 Conclusion **210**
8 The Missing Link: How ASGM Labour and Its Markets Affect Poverty Outcomes **214**
8.1 ASGM Employment Statuses **215**
8.1.1 The Prevalence of Different Employment Statuses and Mixed Strategies **216**
8.1.2 The Reasons for and Dynamics Underlying Choosing Waged or Self-Employed ASGM Work **221**
8.2 ASGM Incomes: Jobs, Employment Statuses, and Their Gendered Nature **228**
8.2.1 Taking Stock of Production Sharing Agreements in ASGM Labour Markets: Locality Matters **228**
8.2.2 A Critique of Previous Research Methodologies **231**
8.2.3 Incomes and Their Link to Employment Statuses **232**
8.2.4 The Gendered Nature of ASGM Incomes **236**
8.3 Classes of ASGM Labour **242**
8.4 The Role of Informal Finance **244**
8.5 Conclusion **249**
Conclusion **255**
Objectives, Research Questions and Methodology **255**
Key Findings **256**
Limitations and Future Research **260**
Policy Recommendations **262**
References **264**
Appendix A: Details Figure 1.1 **320**
Appendix B: Household Survey Questionnaire (English and Swahili) **321**
Appendix C: Interview Guidelines **355**
Appendix D: List of Interviewees **357**

List of Figures

Figure 1.1 *The Relationship Between GDP Growth and Natural Resource Rents, 2000–2019* 36

Figure 1.2 *ASM Populations in SSA* 44

Figure 2.1 *Organisational Structure of ASM Operations* 64

Figure 2.2 *Intersecting Areas of Scholarship Relevant to This Thesis and the Resulting Research Gap* 75

Figure 4.1 *Dimensions of Informality* 97

Figure 5.1 *ASM Employment During the Interwar Period, 1933–1939* 123

Figure 5.2 *Mineral Exports During British Colonial Rule, 1930–1950* 129

Figure 5.3 *FDI in the Mining Sector During Kikwete's Presidency, 2005–2015* 141

Figure 5.4 *Number of Primary Mining Licences Issued, 1998–2020* 147

Figure 5.5 *Tanzanian Gold Exports, 2007–2020* 148

Figure 5.6 *Gold as Percentage Share of Total Exports, 2015–2020* 149

Figure 6.1 *Map of Nyarugusu Ward* 167

Figure 6.2 *Map of Mgusu Ward* 167

Figure 7.1 *Distance of a Household to the Poverty Line in TZS1,000* 192

Figure 8.1 *Organisational Structure of ASGM in Busolwa, Nyarugusu Ward* 230

Figure 8.2 *Stylised Poverty Trap* 244

Figure 8.3 *Stylised Structure of ASM Labour Markets* 247

List of Tables

Table 2.1 *Contrasting Results of Context-Specific and National Labour Market Data from SSA* 63

Table 2.2 *Incomes in Tanzania's Rural Economy: ASGM Activities and Agriculture* 68

Table 3.1 *Sub-Hypotheses* 78

Table 3.2 *ASGM Activities Throughout the Year* 87

Table 5.1 *Legal Changes with Reference to Tanzania's Mining Sector, 1884–2021* 154

Table 6.1 *Income Strata by Location* 168

Table 6.2 *Household Migration Dates* 169

Table 6.3 *Age Structure by Groups and Location* 170

Table 6.4 *Dependency Ratios of Households by Location* 172

Table 6.5 *Educational Attainment Including Those Currently Attending School by Location* 172

Table 6.6 *Educational Attainment Excluding Those Currently Attending School by Location* 173

Table 6.7 *Prevalence of Income-Generating Activities by Location* 177

Table 7.1 *Income-Based Poverty: Survey vs. Official Data by Location (%)* 186

Table 7.2 *Income-Based Poverty: Female-Headed Households (%)* 187

Table 7.3 *Income-Based Poverty: Non-Mining vs. Mining Households by Location (%)* 187

Table 7.4 *Income-Based Poverty: Farming Households by Location (%)* 188

Table 7.5 *Probit Regression Results* 189

Table 7.6 *Expenditure-Based Poverty by Location (%)* 191

Table 7.7 *Expenditure-Based Poverty: Non-Mining vs. Mining Households by Location (%)* 191

Table 7.8 *Shocks Experienced Within the Last 12 Months by Location (%)* 193

Table 7.9 *Correlation Between Reported Statistically Significant Shocks and Distinct Household Characteristics (%)* 195

Table 7.10 *Household Assets by Location* 197

Table 7.11 *Assets by Income Strata and Location* 199

Table 7.12 *List of Assets* 201

Table 7.13 *Results From First PCA* 202

Table 7.14 *Asset Poverty Lines by Location (%)* 203

Table 7.15 *Poverty Dynamics at Both Sites: Quantitative, Qualitative, and Mixed Methods Inference* 212

Table 8.1 *Prevalence of Employment Statuses Across ASGM Households by Location* 216

Table 8.2 *Survey Findings (2019) Compared to National Data (2014) by Location (%)* 217

Table 8.3 *Arable Land Held by Farming Households* 219

Table 8.4 *Prevalence of Employment Statuses Across Farming Households by Location* 219

Table 8.5 *The Relationship of ASGM and Farming Employment Statuses (%)* 221

Table 8.6 *ASGM Incomes Across Employment Statuses by Location* 234

Table 8.7 *ASGM Incomes for Distinct Jobs* 235

Table 8.8 *ASGM Incomes by Gender and Employment Status by Location* 238

Table 8.9 *ASGM Incomes by Gender, Job, and Employment Status* 239

Table 8.10 *Joint Display of Quantitative and Qualitative Evidence: Mixed Methods Inference* 252

Acronyms and Abbreviations

ASGM – Artisanal and Small-Scale Gold Mining

ASM – Artisanal and Small-Scale Mining

ASP – Afro-Shirazi Party

BoT – Bank of Tanzania

CBN – Cost-of-Basic-Needs

CCM – Chama cha Mapunduzi (The Party of the Revolution)

CHADEMA – Chama cha Demokrasia na Maendeleo (The Party for Democracy and Progress)

CR – Critical Realism

DHS – Demographic and Health Surveys

DLM – Dual Labour Market

DOAG – Deutsch-Ostafrikanische Gesellschaft (German East Africa Company)

DRC – Democratic Republic of Congo

FAdev – Foundation for ASM Development

FDI – Foreign Direct Investment

FEMATA – Federation of Miners Association of Tanzania

FGT – Foster-Greer-Thorbecke Indices

FEI – Food-Energy-Intake

GBP – British Pound

GDP – Gross Domestic Product

GEREMA – Geita Regional Miners Association

HCR – Headcount Ratio

HH – Household

HIPC – Highly Indebted Poor Countries

IBRD – International Bank for Reconstruction and Development

IFI – International Financial Institution

IGR – Income-Gap Ratio

ILFS – Integrated Labour Force Survey

ILO – International Labour Organization

IMF – International Monetary Fund

IPIS – International Peace Information Service

ISI – Import Substitution Industrialisation

LEAT – Lawyers' Environmental Action Team

LGA – Local Government Authorities

LSGM – Large-Scale Gold Mining

LSM – Large-Scale Mining

LSMS – World Bank's Living Standard Measurement Survey

MDA – Mining Development Agreement

MMR – Mixed Methods Research

MNC – Multinational Corporation

NFRE – Non-Farming Related Employment

NBS – National Bureau of Statistics

NDC – National Development Corporation

NGO – Non-Governmental Organisation

NHE – New Household Economic Theory

NHS – National Health System

NRGI – Natural Resource Governance Institute

OECD – Organisation for Economic Cooperation and Development

PCA – Principal Component Analysis

PML – Primary Mining Licence

PSA – Production Sharing Agreement

RCT – Randomised Controlled Trial

REPOA – Research on Poverty Alleviation

SACCO – Savings and Credit Cooperative Society

SAP – Structural Adjustment Program

SH – East African Shilling

SLM – Segmented Labour Market

SSA – Sub-Saharan Africa

STAMICO – State Mining Corporation

TANU – Tanganyika African National Union

TAWOMA – Tanzania Women Miners Association

TCM – Tanzania Chambers of Mines

TZS – Tanzanian Shilling

UAE – United Arab Emirates

UNCTAD – United Nations Conference on Trade and Development

UNDP – United Nations Development Program

UNECA – United Nations Economic Commission for Africa

URT – United Republic of Tanzania

US – United States of America

US$ – US Dollar

WB – World Bank

WDR – World Development Report

Introduction

This thesis argues that analysing rural labour markets is pivotal to understanding the impact of informal resource extraction on poverty in the Global South. To test this claim, the research zooms in on a specific country and a particular type of resource extraction: Tanzania's artisanal and small-scale gold mining (ASGM) sector. The thesis enquires to what extent, and how, Tanzania's ASGM sector has reduced poverty for rural households and examines the role of its labour markets. The research answers this question empirically by deploying qualitative and quantitative primary data. Based on a comparative case study, the research examines two case study sites in northwest Tanzania and draws on a political economy analysis of its ASGM labour markets.

By analysing money-metric and asset poverty indicators, the thesis finds that the 2019 poverty levels at both study sites were just as high as reported by a previous study in the same area in 2004. To understand the mechanisms behind this, the research zooms in on ASGM labour. On the one hand, it finds relatively high, but heterogeneous, digger incomes which are shaped by the type of employment status and by individuals' particular employment strategy. On the other hand, waged processing workers, engaged in the crushing and transporting of ore, are found to accrue incomes no higher than agricultural wages. For them, ASGM is no more financially rewarding than farming. Moreover, the thesis finds the high prevalence of waged activities and that workers, particularly diggers, alternate between waged and self-employed labour. The thesis concludes that ASGM's ability to reduce poverty is best described as mixed. As previous contributions have focused on the high average incomes of diggers, the thesis questions this homogeneous picture and argues instead that sectoral labour markets are a major source of stratification. Thus, it challenges the narrative of artisanal and small-scale mining (ASM) as a sector consisting singularly of self-employed individuals and integrates an empirical analysis of labour markets into ASM scholarship.

ASM employs millions of rural households in sub-Saharan Africa (SSA), particularly in Tanzania. Globally, it is estimated that around 42.6 million individuals are engaged in ASM, rendering it the most important non-farming-related employment (NFRE) activity in the Global South (DELVE, 2020).[1] Around 1.5 million Tanzanians

[1] Driven by the sector's low entry barriers and start-up costs, ASM's labour force fluctuates and is subject to marked inwards and outwards migration (UNECA, 2011). This, in conjuncture with ASM's informal nature (see Section 4.1), affects the quality of existing data. Given that ASM activities are not thoroughly

engage in, and approximately 9 million depend on, ASM activities. This is the largest number of ASM dependants in any sub-Saharan African country and the second largest ASM population on the subcontinent (UNECA, 2011).[2] The sector is characterised by low capital levels and a marked prevalence of manual labour. Workers deploy basic tools such as a pick, shovel, or hammer for alluvial or hard-rock mining or engage in auxiliary processing tasks such as crushing and panning ore (Bryceson et al., 2014).[3] ASM is highly informal: in Tanzania, less than 6% of miners hold a formal mining claim (Bryceson & Geenen, 2016).

While ASM was and remains significant for its employment absorption capacity, large-scale mining (LSM) was the main contributor to Tanzania's economic growth. Tanzania experienced sustained economic growth from the 2000s onward: between 2000 and 2019 annual GDP growth averaged 6.3% (World Bank, 2021a). At the same time, gold exports averaged 35.6% of the country's annual exports between 2009 and 2019 and Tanzania's gold production increased from 5 to 40–50 tons annually over the past 25 years.[4] Mining sector growth was mainly driven by LSM and it was hoped that its revenues would be a major driver towards more inclusive and sustainable economic performance and, ultimately, poverty reduction (Chachage, 1995; Fisher et al., 2009; Lange, 2006). In contrast to ASM, LSM is capital-intense, foreign-owned, and characterised by a low labour-to-capital ratio (Andreoni, 2017a).

However, although LSM contributed considerably to Tanzania's GDP growth, the sector's growth did not translate into poverty reduction. Liberalising its economy and the inflow of foreign direct investment (FDI) into LSM led to a highly unequal distribution of mineral rents characterised by weak resource governance, rent-seeking, and grand corruption (Andreoni, 2017a; Cooksey & Kelsall, 2011; Gray, 2015; Poncian & George, 2015). Moreover, poverty indicators convey a mixed picture. Despite the fact that basic needs and food poverty declined between 2007 and 2017 from 34.4% to

captured by baseline surveys (see Section 2.4), assessing the true number of people working in and/or relying on the sector is a notoriously difficult task. This also raises the question of who reports the data. Often this is done by miner unions, who might report inflated numbers to have a stronger bargaining power in the political realm.

[2] Roughly 16% of Tanzania's population indirectly depends on the sector.

[3] The thesis deploys the terms 'artisanal' and 'small-scale mining' interchangeably. However, in the ASM literature, the former sometimes refers to operations without a formal licence and driven purely by poverty. The latter is often applied to operations that are, at least to some degree, formalised, endowed with capital, and thus more mechanised. See Mwaipopo et al. (2004) for a detailed discussion.

[4] BoT (2011b, 2014, 2020); TCM (n.d.)

26.4% and 11.7% to 8%, respectively, the absolute number of people living in poverty increased over those years (Karamba et al., 2019; World Bank, 2020b).[5]

Given the limited success of translating LSM growth into improved local livelihoods, a topical policy debate on the distribution of mineral rents emerged. In Tanzania, beginning in the late 1970s, a policy focus on attracting FDI to the mining sector was set. Yet, this did not translate into significant livelihood improvements for Tanzanians and a considerable national debate on the role of privatisation and FDI emerged (Kulindwa et al., 2003; Lange, 2006). In contrast to his predecessors, President John Pombe Magufuli adopted a different route. Magufuli embarked on a quest to regain national resource sovereignty over LSM rents and publicly supported ASM over LSM interests. This policy U-turn in the management of natural resources caused controversy. Proponents of Magufuli's policies expected an increase in sectoral domestic value-addition and a more transparent distribution of mineral rents. By contrast, the president's critics dismissed his high-profile policies as actioned driven by the attempt to merely court popularity without leading to a substantial scaling-up and formalisation of the sector (Paget, 2017a).

The Tanzanian debate illustrates a broader policy dilemma. On the one hand, governments in resource-rich countries have sought to create an investor-friendly LSM investment climate to capture large mineral rents. Such development strategy, dubbed as 'extractivism' or 'neo-extractivism', has extensively been discussed among scholars in the context of Latin America (Brand & Dietz, 2014; H. Burchardt & Dietz, 2014) but also for SSA (Engels, 2021; Engels & Dietz, 2017; Greco, 2020). As this thesis shows for the Tanzanian case, all too often (neo-)extractivist approaches have rarely translated into improved local livelihoods. The employment capacity of LSM is limited and the access to mineral rents is highly skewed towards those in power, in the context of an "absence of structural transformation" (Greco, 2020, p. 511).

On the other hand, ASM's informal, low-productivity, poverty-driven nature combined with the difficulties to capture sectoral mineral rents, has caused limited interest of governments and ultimately marginalised ASM in policy circles (Bryceson & Jønsson, 2014; Radley & Geenen, 2021). However, because ASM is a source of direct employment for around 10 million people in SSA (World Bank, 2019) and

[5] This mixed poverty reduction trajectory can, to some extent, be explained by the country's low growth elasticity of poverty: a 10% increase in its GDP would result in only a 4.5% reduction in the number of households living in poverty (World Bank, 2020b).

indirectly for millions in Tanzania, the question of how the sector affects local livelihoods, possibly allowing poverty reduction, is highly relevant but empirically underexplored. The conundrum of a strong emphasis of the Tanzanian state on large-scale resource extraction, which has not translated into the broader economic development of Tanzanians – and the underexplored issue of whether ASM can improve local livelihoods and the role of its labour markets – motivates this thesis.

This links to the broader question of why many resource-rich countries have been unable to translate resource extraction into improvements of local livelihoods. This is the second area of enquiry which motivates this thesis. Scholars have long debated whether and how resource abundance shapes economic development. One group of scholars contends that natural resources promote economic growth through forward and backward linkages, and technological spillover effects such as intersectoral learning (Lewis, 1954; Rostow, 1959a; Wright & Czelusta, 2004b). Questioning this view, a second group argues that there is a detrimental relationship, highlighting the sector's enclave tendency, the uneven distribution of resource rents, and the high likelihood of social conflict (see, among others, Auty, 1993; Hirschman, 1958; Sachs & Warner, 1999, 2001). The latter view became the economic orthodoxy in the late 1980s, leading to the emergence of the so called 'resource curse' argument. Drawing on the analysis of large cross-country datasets, this literature contends that resource-abundant countries score lower on development indicators than their resource-scarce counterparts.

This thesis argues that most writings by economists on the resource curse, applying large data sets, are not helpful in explaining *why* some countries experienced economic development despite their strong resource endowment, while others failed to do so (e.g., Sachs & Warner, 1995, 2001). This is because analysing the political economy of the extractives sector, and thus a disaggregated analysis, is necessary to understand context-specific outcomes (see, among others, Rosser, 2006; Saad-Filho & Weeks, 2013). For this reason, this research asserts that the impact of resource abundance is best scrutinised in a country-specific analysis of its political economy. To allow such deeper understanding of transmission mechanisms, the thesis zooms in on country-level evidence of ASM as a particular mode of production.

Research scrutinising ASM's ability to improve livelihoods has yielded mixed results. On the one hand, studies have found that ASM reduces poverty (Fisher et al., 2009; Kamlongera, 2011), generates above-average cash incomes (Bryceson et al.,

2014; Jønsson & Bryceson, 2009; Lange, 2006; Merket, 2019; Pokorny et al., 2019), alleviates hardship and increases food security (Hilson et al., 2013), and strengthens local linkages (Bazillier & Girard, 2017). Yet, on the other hand, evidence also shows that ASM impedes poverty reduction. Scholars have reported that miners are unable to accrue savings and that their incomes cover daily needs only (Adu et al., 2016; Hilson & McQuilken, 2014; Werthmann, 2003), that workers find themselves in a poverty trap (Banchirigah, 2008), that ASM does not improve quality of life (Heemskerk, 2003), and that it has high ecological costs (Obiri et al., 2016; Schueler et al., 2011).

This thesis' novel contribution is its argument that to understand how ASM impacts poverty, attention must be paid to the structure and dynamics of its labour markets. A plethora of case studies (Cramer et al., 2014a; Mueller, 2015; Oya, 2010; Oya & Pontara, 2015; Pontara, 2010; Rizzo, 2011; Sender et al., 2006) have highlighted the prevalence and importance of waged activities in rural labour markets, questioning the mainstream narrative of thin rural labour markets. These studies are centred around the interaction of agricultural labour markets and its impact on poverty in the Global South. Aiming to build on this scholarship, the thesis integrates the structure and dynamics of rural labour markets into the ASM literature. This is an aspect which has been underexplored to date (B. Verbrugge, 2016). Addressing this shortcoming, the thesis aims to provide an innovative analysis of ASM's impact on poverty and to add to the literature on rural labour markets.

Examining resource extraction and its poverty impact with respect to employment requires a good understanding of a number of concepts such as poverty, labour, waged as well as self- employment, and informality. To this end, the thesis draws on different disciplines/subjects: economics, development studies, economic anthropology, and human geography. In so doing, it discusses how poverty ought to be defined and assessed and to what degree quantitative and/or qualitative research methods are helpful. Moreover, the thesis operationalises the concepts of waged and self- employment, as well as the household within their specific context. Further, this research asserts that structural factors such as power relations and politics ought to be integrated when analysing micro-level evidence.

The thesis's main objective is to scrutinise the political economy of Tanzania's ASGM sector with special reference to its labour markets, analysing its ability to reduce poverty. Its research question is:

> To what extent and how has Tanzania's artisanal and small-scale gold mining sector reduced poverty for rural households and what role do labour markets play in this?

To answer this question, the thesis is built around a comparative case study design. Methodologically, it follows a two-stage sequential mixed methods research (MMR) design. Actively engaging with the ontological foundations of each research method, the integration of qualitative and quantitative research occurred as follows. First, I surveyed 160 households at two study sites to assess the economic realities and labour market data. Second, to explore for whom ASGM translated into poverty reduction, and for whom it did not, dynamics which cannot be answered conclusively by a one-off survey, I conducted 39 qualitative interviews. These different types of data allowed to compare the prevalence of poverty with the levels recorded by earlier research at the same study sites in 2004. Further, juxtaposing qualitative and quantitative data allowed to discover, and understand through triangulation, discordant insights emerging from them. Last, qualitative interviews with miners and stakeholders were essential to understand ASGM's political economy and its labour markets in more detail.

The thesis's main finding is that engaging in ASGM translates into heterogeneous poverty outcomes which are shaped by the type of ASGM job and the type of employment status (i.e., where it lies on the continuum between 100% waged and 100% self-employed). This is based on three intertwined aspects. First, poverty rates in 2019 were just as high as reported by a previous study in the same area in 2004. Moreover, survey and interview data suggest that ASGM households do not fare better than their non-mining counterparts. Second, waged ASGM jobs and processing tasks yield much lower incomes than the higher average incomes reported for diggers by previous contributions (Bryceson et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006; Merket, 2019). Both findings are important as two-thirds of the ASGM labour force in my sample engaged in waged labour and one-third of the workforce engaged in processing jobs. Thus, the thesis contends that the reported higher incomes of ASM diggers must be seen in the context of significantly lower incomes accrued through ASM-processing tasks. Consequently, by questioning the picture of a homogeneous sector and considering *all* types of ASGM, the thesis calls for a more nuanced view of ASGM's ability to reduce poverty. Third, the thesis shows that working for a wage in ASM is much more common than official data on rural labour indicate. Therefore, the

thesis contributes to the literature challenging the orthodox assumption of self-employment as the main and/or only informal employment status.

The research seeks to contribute to existing knowledge in three ways. First, given that evidence in the form of disaggregated data on ASM is scant, this work aims to fill this gap by providing qualitative and quantitative primary data. Second, the thesis connects the literature on the structure and dynamics of rural labour markets in the Global South to the scholarship on the impacts of resource extraction on the household. Third, the thesis seeks to contribute to the broader policy agenda. It highlights that incorporating organisational practices and an understanding of labour structures and dynamics into formalisation efforts in the ASM sector is essential.

This thesis is structured as follows. Following this introduction, Chapter 1 begins by analysing the macro-level literature on the effects of mineral extraction on economic development. It reviews different and antithetical arguments on the matter and it examines the shift towards empirically grounded works at the micro level. The chapter argues that context-specific analysis is required to draw meaningful analytical evidence regarding whether resource extraction works, and for whom. The chapter then focuses on ASGM in a specific country: Tanzania. In so doing, it analyses broader changes in agrarian livelihoods and the emergence of ASM in Tanzania and examines the existing works on Tanzania's ASM sector and its effects on poverty.

Chapter 2 scrutinises the literature on rural labour markets and links them to poverty research. The chapter begins by discussing different economic schools of thought and how they conceptualise labour markets. Subsequently the analysis examines rural, and mostly informal, labour markets and then zooms into ASM labour markets. The chapter finds that a focus on social and power relations in ASM labour markets, and how they affect socioeconomic outcomes such as poverty, are inadequately addressed in existing ASM literature.

Chapter 3 discusses this work's research methodology. The chapter discusses the commensurability of different research methodologies and the limitations of approaches deploying qualitative or quantitative research methods only. Subsequently, the chapter introduces the quantitative research method deployed in this study: a household survey with a specific focus on rural labour. It also discusses the qualitative research method adopted: semi-structured interviews with ASGM workers and sectoral experts. Lastly, it discusses the reasons for choosing the Nyarugusu and Mgusu wards, both located in northwest Tanzania, as the study sites.

Chapter 4 outlines the conceptual framework of the thesis. The chapter reviews the key concepts deployed in this study, such as poverty, the household, economic informality, and its political economy framework. It begins by discussing different theories and concepts of economic informality and then considers how this research conceptualises and operationalises the concept of the household. Next, the chapter examines distinct measures of poverty and their conceptualisation in orthodox and heterodox social science scholarship. Lastly, the chapter discusses the links between the concept of economic informality and of labour markets and the framework and the framework of 'classes of labour' by Bernstein, central to the thesis's political economy framework.

Chapter 5 scrutinises ASM in Tanzania in its historical, political, and legal context. It begins by outlining the role of mining activities during the German and British occupations. Subsequently, the chapter examines the nationalisation of the mining sector after Tanzania's independence as well as the effects of economic liberalisation on Tanzania's mining codes, its small miners, and investors. Next, it analyses the government's policy U-turn during the presidencies of Jakaya Kikwete and John Pombe Magufuli. Lastly, the chapter adds qualitative data from sectoral stakeholders and contains a brief commentary on the ASM policies of the incumbent president, Samia Suluhu Hassan.

Chapter 6 takes the reader to Geita Region in northwest Tanzania. Its main aim is to provide information on livelihoods at both study sites. The chapter begins by outlining logistics on the ground and methodological choices made in the field. Subsequently, it examines evidence regarding sample and household demographics, and living arrangements, and maps livelihood activities.

Chapters 7 and 8 constitute the empirical core of the thesis, organised by the two major themes of this work. Chapter 7 elaborates on the effects of ASGM on poverty measures while Chapter 8 analyses the ASGM labour markets at the two study sites and links these findings to those of Chapter 7. By integrating quantitative as well as qualitative evidence, both chapters highlight where one type of data complements and expands the other and where possible discordance occurs.

Chapter 7 asks whether ASM incomes enable households to escape poverty. It begins by discussing how existing deficiencies of money-metric poverty measures can be supplemented by other types of quantitative indicators. This part of the chapter analyses different money-based poverty rates, the vulnerability of households to shocks,

and develops an asset index. Subsequently, it discusses respondent-based views of how ASGM has, or has not, helped them to reduce poverty. The chapter concludes by integrating both approaches and by situating the findings in the wider literature.

Chapter 8 links these findings on poverty to the structure and dynamics of ASGM labour markets. The chapter begins by discussing scholarly knowledge on the structure of ASM labour markets and then zooms in on the specificities at both sites. Drawing on primary qualitative evidence, it looks at the reasons why respondents are engaging in waged, self-, or hybrid ASGM employment. Next, the chapter analyses the ways in which different jobs and labour relations yield distinct incomes and briefly analyses the gendered nature of ASGM labour markets. Subsequently, it discusses the role of capital and informal finance. The chapter concludes by linking this chapter's findings to the effects of ASGM on poverty.

Chapter 9 concludes this thesis. It begins by summarising the main findings of this thesis and subsequently notes its limitations and discusses avenues for further research at the intersection of rural poverty and non-farming labour. It concludes by discussing implications for the political sphere.

1 From Macro to Micro: The 'Resource Curse' Debate and Zooming In on ASM

> Scholars have been asking the wrong question: rather than asking why natural resource wealth has fostered various political pathologies and … promoted poor development performance, they should have been asking what political and social factors enable some resource abundant countries to utilise … natural resources to promote development and prevent other … countries from doing the same.
>
> (Rosser, 2006, p. 3)

This chapter presents theoretical and empirical evidence on the impact of resource extraction on economic development. The quote above emphasises that most works by economists underexplore the political and social factors that explain its positive development outcomes. Exploring the reasons behind this, the chapter finds that cross-country analyses have led to a reductionist understanding of institutions and of the political context as both are specific to contexts. This necessitates, in order to understand context-specific outcomes of resource extraction, a more disaggregated analysis. Thus, the chapter analyses the impacts of resource extraction on the household-level and examines a second branch of literature: works on the impact of ASGM on poverty in Tanzania.

The chapter is structured as follows. The first part of this chapter discusses the literature on the effects of resource abundance on a country's economic development. It presents different theoretical arguments, discusses the changing empirical methodologies over time, and then reviews different criticisms of the existing body of literature. This first part concludes that understanding the macro-level effects of mineral extraction on the economy necessitates integrating power into the analysis; only then can politics and distributional outcomes be understood. It further contends that context-specific outcomes are not only shaped by a country's political choices but also by its history, and that this calls for context-specific research on ASGM. Building on this, the second part of the chapter analyses a specific form of resource extraction, the extraction

of minerals, and its socioeconomic implications: the effects of ASM on poverty. Subsequently, the chapter analyses the emergence of ASM activities as well as scholarly debates before going on to examine the structure of Tanzania's ASGM sector with special reference to its poverty impacts.

1.1 The Macro Perspective on Abundant Natural Resources and Their Effects on Development: Changing Arguments Over Time

Social scientists have expressed contrasting views as to how a strong natural resource base affects a country's economic development. Some characterise it as detrimental to development, even a curse, while others see it as a blessing. As the chapter will show, proponents of the resource curse paradigm contend that resource-rich countries underperform economically due to their strong resource endowment (Sachs & Warner, 1995, 2001; Sala-i-Martin & Subramanian, 2003), linking this to politics (Karl, 1997; Lam & Wantchekon, 1999; Ross, 2001b), internal stability (Collier, 1998; Ross, 2004), and institutions (Bulte et al., 2005). Speaking against this, a second group of scholars advocates the development potential of resource extraction. They argue that resource extraction has a positive impact through direct and indirect poverty reduction, local employment, and procurement (Gamu et al., 2015; Weber-Fahr et al., 2001). The remainder of this section examines the arguments of both camps over time.

Most classical economists viewed economic growth based on exploiting natural resources as harmful to a country's development. David Hume ([1777] 1987) in the late 18th century, opined that "[since] the discovery of the mines in AMERICA, industry has encreased [*sic*] in all nations of EUROPE, except in the possessors of those mines; and this may justly be ascribed … to the encrease [*sic*] of gold and silver" (p. 286). (Oyinlola et al., 2015) suggest that his thinking was shaped by historical events such as the outperformance of gold-rich Spain by the resource-poor Netherlands in the 17th century. Consistent with Hume's view, Adam Smith perceived such a development strategy as undesirable. On ore exploitation and its effects on a country's development, he (1776) wrote:

> Projects of mining, instead of replacing the capital employed in them, together with the ordinary profits of stock, commonly absorb both capital and stock. They are the projects, therefore, to which of all others a prudent law-giver … would least chuse [*sic*] to give any extraordinary encouragement. (p. 562)

Thus, for Smith, Hume, and most classical economists, as resources cannot be replenished, any economic development strategy ought to move towards a capital-, and later knowledge- and technology-, based path (Wright & Czelusta, 2007). This one-sided reading was questioned by scholars during the 20th century, as countries with a strong resource base such as the United States, Canada, the United Kingdom, and Australia, had experienced prolonged economic success.

Fuelled by these instances, the staple theory of growth emerged. Staple theorists argued that staple exports, given a high land to labour or capital ratio, ought to constitute the "leading sector of the economy" to set "the pace for economic growth" (Watkins, 1963, p. 144). Thus, linked to Canada's growth trajectory, the central question of staple theorists was how staple exports affect the development of the domestic economy (Watkins, 1963). Their thinking was that resource exports would draw capital into the resource-intense sector and that the profits from this booming core sector would then be reinvested in local infrastructure (Watkins, 1963) which, in turn, would engender more diversified, value-added economic activities (Ross, 1999). This strong belief in the advantageous role of natural resources for the economy was neatly summarised by Ginsburg (1957): "the possession of a sizable and diversified natural resource endowment is a major advantage to any country embarking upon a period of rapid economic growth" (p. 211).[6] Drawing on Hirschman (1958), there were two possible outcomes. One was, if backward linkages were created then the booming staple-exporting sector might lead to investments further down the supply chain in sectors and firms providing inputs, for example, fertilisers. The other is, if forward linkages emerged, then natural resources would be processed, or used, as an input in upstream activities.

In addition to staple theorists, another camp of development economists argued that extracting resources would spur domestic demand. Rostow (1959) claimed that a strong resource base enables developing countries to close the gap from under- to industrial development, allowing a 'take-off' of the economy. Rostow's thinking was grounded in the observation of marked imbalances of factor endowments, abundant labour and scarce capital in the Global South during the 1950s (Ross, 1999). To address this imbalance, attracting foreign capital by exporting primary commodities was

[6] This view was further supported by Baldwin (1966), Lewis (1954), Spengler (1960) and Viner (1952), among others.

deemed a viable path (Ross, 1999; Saad-Filho & Weeks, 2013). These arguments resonated with the idea that commodity exports generate domestic demand for manufacturers (Lewis, 1954), the underlying premise being that successful and sustained industrialisation of an economy is pivotal to its long-run economic growth (Chenery, 1979; Di John, 2009; Kaldor, 1967). Repeatedly cited examples are Venezuela from the 1920s to the 1970s (Di John, 2009; Karl, 1997), Australia since the 1960s, Norway since 1969, Chile since 1983, Peru since 1992, and Brazil since 1995 (Wright & Czelusta, 2004a).

These positive assessments by these scholars were questioned from the 1950s onwards by an emerging school of structuralist development economists. Prebisch (1950) and Singer (1950) challenged the prevailing orthodox narrative of a positive effect, arguing that in the long run prices of primary commodities declined faster relative to the prices of manufactured goods. Their reasoning was based on the premise that world demand for primary commodities is inelastic to world income, suggesting that an increase in world income by 1% would lead to an increase in global demand for primary commodities of less than 1% (J. Frankel, 2010). Consequently, structuralists asserted that the terms of trade for primary commodities deteriorate over time and that a non-diversified, primary commodity-exporting economy cannot sustain itself. Specialising in primary commodities, combined with a slow rate of technical progress in the primary sector and/or a negative trend in commodities' terms of trade, became an explanation of why developing economies lag behind. Drawing on this, Hirschman (1958) added that natural resources attract foreign investment turning the sector into an enclave. For him:

> the grudge against what has become known as the 'enclave' type of development is due to this ability of primary products from mines, wells, and plantations to slip out of a country without leaving much of a trace in the rest of the economy. (p. 110)

Thus, he questioned the existence of linkages from the extractive sectors to the rest of the economy, contradicting the staple theorists' theoretical propositions.

To conclude, studies in the tradition of Hirschman (1959) and Prebisch (1950) were theoretical and inductive analyses, examining the regular conditions of a nation's (under-)development.[7] Structuralists emphasised that a country's external environment,

[7] Prebisch examined the Latin American continent while Hirschman analysed Colombia.

and its economic and political context shape the outcomes of resource extraction.[8] At the same time, they contended that forward and backward linkages were weaker for mining and agriculture than for the manufacturing sector when profits stemming from natural resource extraction were expatriated (Hirschman, 1958; Mikesell, 1997). Having outlined how classical, neoclassical, and structuralist views on resource extraction and their impact on economic development contrasted over time, the next paragraphs discuss the transmission mechanisms, as suggested by different theoretical traditions, emerging from the 1980s onwards. We begin by reviewing economic theories and continue by discussing explanations by political scientists.

Beginning in the 1980s, the concept of the *Dutch disease,* named after the decline of the Dutch manufacturing sector due to the discovery of natural gas, emerged.[9] Popularised by Corden and Neary (1982; see also Corden 1984), it was built on a two-sector model: one sector producing non-traded goods (e.g., services) and the other traded goods (e.g., manufacturing). Moreover, technology was assumed to be static and employment to be full (Neary & van Wijnbergen, 1985). The theory's chain of causality is as follows. In the beginning, given that an economy is in full-employment equilibrium, a country's currency strengthens vis-à-vis the rest of the world, as (foreign) capital flows into a booming resource-intense sector. Subsequently, wages in this resource-intense sector of the economy rise and workers are pulled towards it. This reallocation of labour and capital is called the *resource movement effect* (Corden & Neary, 1982).[10] At the same time, the appreciation of the domestic currency renders other, domestically produced, tradeable goods less competitive in the global market. Consequently, sectors with a high export share, such as manufacturing and agriculture, are negatively affected and become less competitive. This 'crowding-out' of traditional sectors (e.g., manufacturing) by a prospering resource-intense export sector (e.g., gold mining) leads to less investment flowing into the former.

Crowding out of manufacturing is argued to have a particularly detrimental impact on economic performance given its "unique growth enhancing characteristics" (Di John, 2011, p. 169; Kaldor, 1967). Among formalisations of the Dutch disease, this

[8] Adding to scholarly debates, structuralist explanations translated into policies, particularly in South America, in the form of import substitution industrialisation (ISI), which emerged in the 1950s, 1960s and 1970s (J. Frankel, 2010).

[9] Corden (1984) notes that the term appears to have been coined in *The Economist* of November 26, 1977, "The Dutch Disease", *The Economist*, 26 November 1977: pp. 82-83.

[10] Higher real incomes in the booming sector might lead to extra spending on services. This second effect is also called the spending effect (Corden & Neary, 1982).

uniqueness of the traded goods sector is often asserted to be exhibited through strong human capital externalities such as learning by doing (Krugman, 1987; Matsuyama, 1992; Sachs & Warner, 1995). Given that the traded goods sector exhibits increasing returns to scale, a resource boom, shrinking the size of the manufacturing sector, might hinder or even invert industrialisation (Murphy et al., 1989; Sachs & Warner, 1999). Consequently, deindustrialisation has been highlighted as an important detrimental side effect of Dutch disease (Di John, 2011).

That said, scholars have highlighted that growth based on an emerging resource-intense sector can open up policy space. This may come about either by investing foreign exchange earnings, acquired through mineral exports, in foreign machineries to improve the domestic manufacturing capital stock (Di John, 2011); or by learning spillovers from the resource-intense to the manufacturing sector (David & Wright, 1997). Therefore, the negative implications of the Dutch disease can be moderated by industrial as well as monetary policy. This illustrates that the impact of natural resources is strongly mediated by political channels, rendering its outcome non-deterministic.

There are diverging views on the role of the state in this: on the one hand, the state is understood as a central actor which may promote industrial policies to enhance efficiency and sectoral learning or by affecting the distribution of revenues through local content policies, local linkages, and changes in legal codes (M. W. Hansen et al., 2016; Lange & Kinyondo, 2016). Heterodox economists contend that temporary import protection, together with the domestic development of refinery and processing mineral supply chains, aids a country's development (Andreoni & Chang, 2016; Chang, 2004; Fine, 1999). On the other hand, classical and liberal economists contend that the state's role ought to be minimal and non-intervening in market mechanisms (Buchanan et al., 1980).[11] The Dutch disease argument stands in this latter tradition, as it is purely economic. It looks at neither how politics shapes distributional outcomes of resource abundance nor at how distinct structures and dynamics of extractive sectors might lead to different outcomes. This oversight is problematic, for reasons that will become clear in the next paragraph, discussing political transmission mechanisms. We begin by analysing the creation and distribution of rents accrued through resource extraction.

[11] Buchanan et al. (1980) defined the role of the state as "restricted largely, if not entirely, to protecting individual rights, persons and property, and enforcing voluntarily negotiated private contracts" (p. 9).

Foreign exchange earnings from exporting minerals are resource rents and the question of who is capturing them and how they are distributed is at the core of writings on the rentier state and rent-seeking. Both conceptualisations incorporate a country's historical trajectory as well as its institutional settings to analyse the outcomes of resource abundance. In his seminal work on the Iranian rentier state, Mahdavy (1970) defined a rentier as a centrally organised state which accrues substantial amounts of external rents. The concept was then formalised for Latin America by Karl (1997). In the words of Saad-Filho and Weeks (2013) "rents are the returns to a factor of production above the amount necessary to bring that factor into use" and "always the result of market distortions" (p. 19). These rents might accrue in cases of (foreign) demand for a(n) (artificially) scarce, but precious, product such as gold. Mineral rents are captured by the state in the form of revenues and royalties, while their distribution strongly depends on the distribution of power. In the case of the presence of a non-benevolent government or a small hereditary elite, negligible incentives exist to share these rents: consequently, a large fraction of society might be excluded from this strong natural resource base (Mahdavy, 1970). Moreover, large resource rents accrued through the government harm tax incentives, as the fiscal base is strengthened by these rents. This leads to a rather tenuous administrative capacity and affects the state's ability to bargain perversely (Di John, 2011).

Empirical evidence supports rent-seeking as a transmission mechanism (Bulte et al., 2005; Isham et al., 2005) and has resulted in a number of findings (Auty, 2006; Karl, 1997). One is that the costs for societies in mineral-rich countries are lower if the allocation process of the revenues is subject to bargaining processes between a variety of interest groups. However, the larger the endowment of natural resources, the more likely it is that political processes, such as rent-seeking and corruption, will lead to negative development outcomes (Di John, 2011).

The literature on rent-seeking is, however, not without its critics. First, the state is not discussed in the required depth and is treated as a unitary agent. This is problematic, as any political system is the result of complex bargaining processes and social relations, culminating in a coalition of diverging interests within the state (Jessop, 2016). Second, how leaders obtain and maintain access to these rents in the first place is barely addressed and the predatory behaviour of a political elite is often assumed but rarely elucidated (Di John, 2011). This relates to the question of how power and control over resources is exercised and structured within society and the state. It is often

assumed that resources are state-owned. Yet, this is not always the case nowadays, as private actors are becoming more important owners of resources (Luong & Weinthal, 2006).[12] Third, in the past, resource ownership was conceptualised more as a static, rather than a dynamic, variable within the macro-level literature on institutional settings as transmission channels of the resource curse. To conclude, even though the concept of the rentier state is valuable, it is deterministic insofar as it makes very little attempt to explain how some mineral-abundant economies diversified successfully. For this reason, a country's governance trajectory with respect to its extractive sector ought to be analysed within its changing historical context.

Within the discussion on political transmission channels of the resource curse, corruption is frequently discussed (Gylfason, 2001; Sachs & Warner, 1999). The premise is that the security of property rights is negatively affected by keeping bribes secret, translating into lower investment levels. In this regard, various scholars claim that the existence of easily accessible rents has strong implications for the institutional framework. Some assert that a strong resource base makes it less likely that democratic institutions will develop (Lam & Wantchekon, 1999; Mehlum et al., 2006; Ross, 2001b), while others allege that it causes democratic accountability to be lower (Jensen & Wantchekon, 2004; Ross, 2001b), and jeopardises decentralised decision-making as well as the development of a successful rule of law (Tsui, 2011).

Leite and Weidmann (1999) were the first to show that resource abundance influences the shape of the institutional macro context. They found that while resource abundance had no direct effect on economic performance, it did have an important indirect one: rent-seeking behaviour leads to increased corruption which in turn harms economic growth. A related branch of literature asserts that this institutional transmission channel renders resource-abundant countries more vulnerable to internal armed conflicts and affects political and macroeconomic stability, and economic growth adversely (Brückner & Ciccone, 2010; Collier, 1998; Collier & Hoeffler, 2005; Welsch, 2008; Wick & Bulte, 2006). In contrast, Brunnschweiler and Bulte (2009) asserted that the causal chain is the other way around and that internal conflict causes dependence on resource extraction. They contend that resource dependence is

[12] In this vein, two conceptualisations of rent distribution across elites are the theory of limited access order (LAO) and of political settlements. However, it is beyond the scope of this work to elaborate on their distinct theoretical underpinnings.

endogenous with respect to conflict, claiming that applying alternative instrumental variables for resource dependence renders prior results insignificant.

Brunnschweiler and Bulte's (2009) objection illustrates one of the challenges in assessing any causal quantitative effect of institutions on mineral-based economic growth: the problem of endogeneity.[13] Applying these concepts in an econometric exercise, institutions are either interpreted literally; for example, by the rule of law, or in a more abstract sense, for example, through established cultural and social norms in a given group. Likewise, economic growth and resource extraction are sometimes applied interchangeably. Regressing the two, it might well be the case that a third variable, such as low skill levels, leads to detrimental outcomes of resource-based growth. In most cross-country studies, this problem of endogeneity is addressed by applying instrumental variables.[14]

We have seen that this negative association, diverging from the positive narrative prevailing during most of the 20th century, became dominant from the late 1980s onwards. Consequently, both the World Bank and the International Monetary Fund (IMF) aligned their agendas towards the narrative of resources as a curse for economic development (Rosser, 2006). Mirroring these changing narratives on resource extraction and economic development, the research methodologies applied changed over time. They are discussed next.

1.2 Empirics: From Cross- to Sub-National Evidence

The methodologies used to study the impact of resources on development have changed over time. From the 1950s onwards, the debate was dominated by theoretical arguments, often ideologically-loaded, whereas in the later 1980s and early 1990s the discourse became more empirical (Ross, 1999), as macroeconomic indicators such as secondary datasets on trade, fiscal, and sectoral evidence began to be analysed. Auty (1993) and Gelb et al. (1988) are the most prominent examples of this increasingly data-grounded approach.[15] Their country case studies concluded that resource-abundant

[13] The implicit assumption being that 'good' institutions translate into higher economic growth.
[14] See, for instance, J. Frankel (2010).
[15] Auty (1993) scrutinised mineral-rich Peru, Bolivia, Chile, Jamaica, Zambia, and Papua New Guinea, while Gelb et al. (1988) analysed oil-abundant Algeria, Ecuador, Indonesia, Nigeria, Trinidad and Tobago, and Venezuela.

countries were outperformed by their counterparts in terms of economic growth “by a considerable margin” (Auty, 2001, p. 840).

Parallel with the shifting narrative towards resources as a ‘curse’, from the mid-1990s onwards scholarly focus turned towards analysing cross-country regressions. The advent of econometrics allowed the analysis of large cross-country datasets and the derivation of generalisable results while deductive testing of hypotheses through statistical software was pioneered by Sachs and Warner (1995, 2001). Their main finding was that countries with a high ratio of natural resource exports to GDP in 1971 (the base year) grew more slowly from 1971 to 1989 than their resource-scarce counterparts. Their theoretical model comprised three sectors: a tradeable natural resource sector, a tradeable non-resource sector, and a non-tradeable sector. They claimed that the greater the natural resource endowment, the higher the demand for non-tradeable goods and, consequently, less capital and labour would be allocated to the manufacturing sector. This inverse relationship persisted when controlling for initial per capita income, trade policies, government efficiency and investment rates. In a nutshell, Sachs and Werner, through statistical quantification, established the resource curse narrative to be a generalisable law.

Likewise, a discussion unfolded on how ‘resource abundance’ ought to be operationalised and different definitions surfaced. Sachs and Warner (1995) measured ‘resource abundance’ through the ratio of primary exports to national income (primary export intensity). Yet, some scholars contended that this led to incorrect findings and argued instead that defining resource abundance as the mineral stock per capita findings is more helpful (Saad-Filho & Weeks, 2013; Stijns, 2005). This broader critique was based on two observations.

First, measuring ‘resource abundance’ as the ratio of primary exports might yield only a proxy of development failures which are linked to “political structures and institutions [that] have failed to support sustained economic development” (Wright & Czelusta, 2007, p. 184). Thus, a lack of GDP growth might have little to do with aspects “inherent” to natural resources, yet be more likely to occur across the sampled countries (Wright & Czelusta, 2007, p. 184). This may be because developing countries in general, whether with or without a marked resource base, are more likely to be subject

to internal conflict and/or political instability compared to developed countries (Saad-Filho & Weeks, 2013). This selection bias might render inferring causality difficult.[16]

Second, the empirical results on the effects of resource abundance on development outcomes in an econometric analysis depend on the growth model adopted. The assumptions in neoclassical growth models shape the measured effect of natural resources on economic growth (Stijns, 2005). On the one hand, according to the Sachs and Warner (1995) growth model, learning by doing is proportional to the relative size of the manufacturing sector and is not present in other sectors such as mining (Stijns, 2005). Yet, the example of the United States illustrates that learning processes initiated by a growing mining sector might exist. For the US, David and Wright (1997) asserted that resource abundance shaped and propelled the emergence of the country's manufacturing sector. Large investments in "exploration, transportation, geological knowledge, and the technologies of mineral extraction, refining, and utilization" were argued to be a form of "collective learning" transferable to other sectors (Wright & Czelusta, 2004b, p. 10). De Ferranti et al. (2002) echoed this, attesting to the US mining sector the ability to build "a strong technological system from which modern manufacturing developed" (p. 4). Thus, the nature and structuredness of the learning processes necessary to realise a country's resource potential are important (Wright & Czelusta, 2007). On the other hand, the advantageous role of natural resources is underestimated when applying per capita income, a variable which is often included in neoclassical growth models (Stijns, 2005). Both aspects illustrate that the effect of resource abundance on growth depends on the model adopted. Having engaged with some of the criticism, it is important to note that the conceptualisation of 'resource abundance' affects the outcomes of cross-country regressions.

Studies defining 'resource abundance' as the ratio of resource exports to GDP, in line with Sachs and Warner (2001, 1995), often confirm the hypothesis of a 'curse'. Here, examples are Gylfason (2001), Ross (2012, 2001b), Sala-i-Martin et al. (2004), and Sala-i-Martin and Subramanian (2003). Drawing on the analysis of large macro-level datasets, research suggested a set of different transmission mechanisms making resource abundance detrimental to development, through price volatility (van der Ploeg

[16] Moreover, a resource-abundant country's manufacturing sector might be intensively using domestic resources, while only a small fraction is exported (Stijns, 2005). Thus, the ratio of primary exports would only be of limited explanatory power.

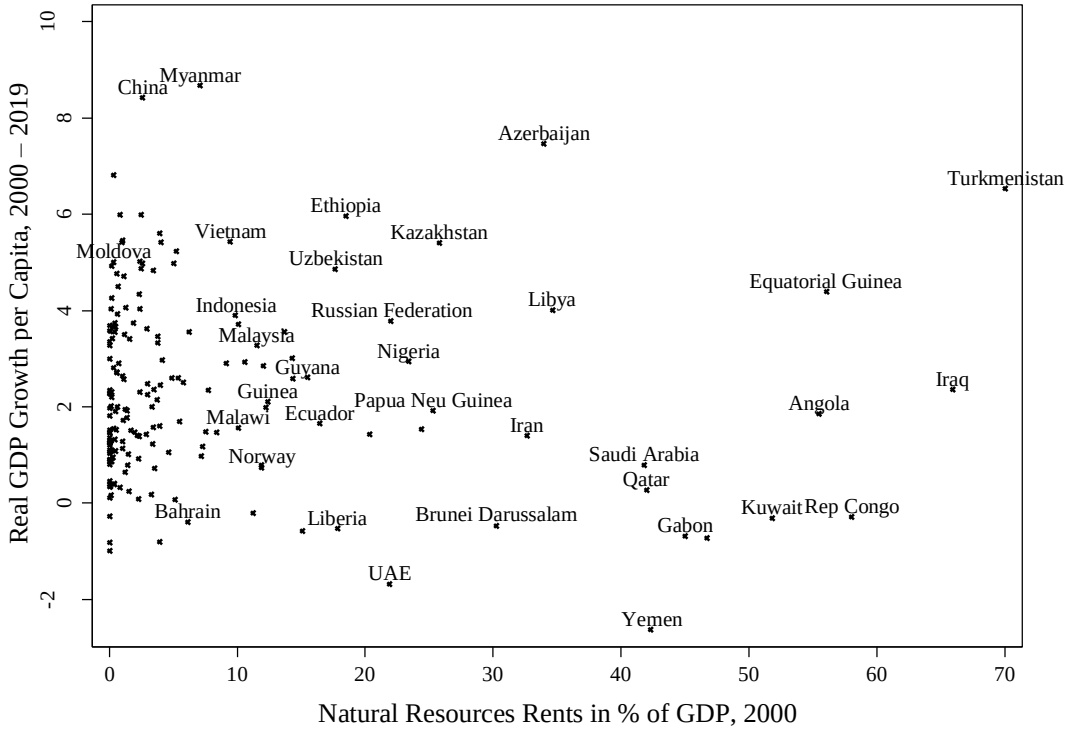
& Poelhekke, 2017), an investment gap in human capital (Ahlerup et al., 2016; Birdsall et al., 2004; Gylfason, 2001; Papyrakis & Gerlagh, 2004), and the use of resources as collateral leading to a debt overhang (Manzano & Rigobon, 2001; Sarr et al., 2011).[17] On the contrary, when 'resource abundance' is measured through rent-based approaches such as export value accrued per worker or reserves per capita, the hypothesis of a 'curse' is often rejected (Saad-Filho & Weeks, 2013). For instance, Herb (2005) looked at the counterfactual GDP per worker that a rentier state would have if it were not resource abundant. For instance, for oil abundant Iraq, he computed an average of the GDP of Egypt and Jordan. The idea is that such measure is not correlated with resource rents. Deploying a lagged dependent variable, the research does not find evidence for a negative effect of resource rents on democracy scores. Yet, as the author acknowledges, missing observations and the fact that the "rentierism coefficient is negative across a variety of model specifications" (p. 310) requires caution.

Herb's (2005) study exemplifies a common pitfall of cross-country studies, their silence on the actual processes explaining why the outcomes of resource abundance differ across countries, institutional settings, and resources. Figure 1.1, following closely work by Sachs and Warner (2001, p. 829) illustrates this point. It plots countries annual GDP per capita growth from 2000 – 2019 against the percentage share of their minerals rents in GDP as a proxy for resource abundance. Despite the fact that real GDP per capita growth continues to be slightly positively correlated with low levels of mineral rents, such relationships do not elucidate why for example the Russian Federation managed to embark on a growth path while the United Arab Emirates (UAE), equally dependent on resource rents, did not.[18]

[17] This last transmission channel links back to the theoretical underpinnings by Prebisch (1950) of price volatility (Andersson et al., 2015).
[18] The case of Turkmenistan represents a statistical outlier, which underlines the need to search for context-specific answers to different outcomes of resource abundance.

Figure 1.1

The Relationship Between GDP Growth and Natural Resource Rents, 2000–2019



Note. The Figure is an updated version of Sachs and Warner (2001, p. 829), who applied 1970 as a base year. GDP aggregates are based on constant 2010 US$, n=187. See Appendix A for more details. Resource rents are defined as the difference between the value of production for a mineral stock at world prices and their total production costs. Source: https://data.worldbank.org/indicator/NY.GDP.MINR.RT.ZS.

Such unanswered aspects in explaining different outcomes of resource abundance have sparked methodological criticism, as for instance by Gamu et al. (2015):

> Quantitative analyses should be combined with qualitative ones to allow scholars to avoid some of the reductionist tendencies of previous large-N cross-national studies, which tend to rely on nationally aggregated data and compare often vastly diverse extractive sector and institutional and contexts through a still limited range of variables. (p. 175)

The quote underlines a dilemma: searching for generalisable relationships comes at the cost of underexploring transmission mechanisms, which are specific to a country's historical and political context. Yet, this is important, as the nature of outcomes of resource abundance are decisively shaped by political and institutional factors (Karl, 2007). Karl claims that an "efficient, transparent, and just distribution of the costs and benefits" (p. 259) of resources inevitably requires political solutions and that the resource curse ought to be understood first and foremost as a rentier problem.

Even though empirical studies have detected different transmission mechanisms for the harm that natural resource abundance does to economic growth, its effects on poverty reduction are contested. Studies deploying longitudinal data cast doubt on whether a clear empirical relationship between resources and economic development, in the form of pro-poor growth, can be established. Davis & Vásquez Cordano (2013) found neither a positive nor a negative statistically significant effect of resource extraction on poverty-reducing economic growth, arguing that no "persistent statistical phenomenon" is observable (p. 138). Consistent with this, Loayza and Raddatz (2010) reported that growth in industrial mining has no statistically significant impact on poverty.

Another limitation of cross-country studies is that they are based on the country level as a unit of analysis. This has sparked criticism, as distinct outcomes of resource abundance have been reported at the sub-national, regional, and local levels (Carter, 2008). From the early 2000s onwards, as a response to this, a plethora of studies focusing on more disaggregated unit of analysis, emerged. Most combined development research with anthropological, political science, and human geography scholarship.

Country-specific empirical studies, assessing the impacts of resource abundance in *developed* and *emerging* economies, were published. This includes scholarly works on Brazil (Caselli & Michaels, 2013), Chile (De Gregorio & Labbé, 2011; Lagos & Blanco, 2010), China (Ge & Lei, 2013; Liu, 2014), Norway (Gylfason, 2011), the United States (Freudenburg & Wilson, 2002; Keniston & Allcott, 2015; Michaels, 2011; Papyrakis & Gerlagh, 2007; Perdue & Pavela, 2012; Slack & Jensen, 2004), Russia (Buccellato & Mickiewicz, 2009), and South Africa (Nel et al., 2014). Another set of contributions analysed the effects of resource abundance in *developing* economies at the sub-national and local level. They cover countries as diverse as Bolivia (Hinojosa, 2011), Burkina Faso (Jaques et al., 2006; Pokorny et al., 2019; Werthmann, 2003), the Democratic Republic of the Congo (DRC) (Bryceson & Geenen, 2016; Geenen & Radley, 2014), Ghana (Ackah-Baidoo, 2013; Bloch & Owusu, 2012; Bush, 2009; Hilson, 2012; Hilson et al., 2013; Hilson & Pardie, 2006), Indonesia (A. Booth, 2003; Cust & Rusli, 2014; Rosser, 2007), Malawi (Kamlongera, 2011), Mali (Andersson et al., 2015), Nigeria (Idemudia, 2009, 2012; Pegg & Zabbey, 2013), Peru (Aragón & Rud, 2013; Bury, 2005; Loayza et al., 2013), the Philippines (B. Verbrugge, 2015), Sierra

Leone (Zulu & Wilson, 2012), and Zambia (Mwitwa et al., 2012; Van Alstine & Afionis, 2013).

The empirical results of country-case studies concerning the effects of mining are mixed. On the one hand, studies point to the existence of positive effects of resource extraction on distinct developmental aspects, effects exerted through distinct transmission channels and differing at the national, regional, and local levels.[19] A poverty-reducing effect of ASM employment is found only in local case studies (Bush, 2009; Fisher et al., 2009; Heemskerk, 2003; Hilson et al., 2013; Kamlongera, 2011 quoted in Gamu et al., 2015). Employment by LSM companies was found to be of limited importance and mostly indirect. Here, the sourcing of non-tradeable goods by the industrial extractive sector (Aragón & Rud, 2013; Caselli & Michaels, 2013) yields positive linkages and it has been argued that LSM generates around 2-25 indirect jobs for each direct position (Weber-Fahr et al., 2001). For ASM, a multiplier of six indirect jobs has been estimated (Hilson & McQuilken, 2014).

On the other hand, in contrast to this positive narrative, other studies paint a darker picture, in which negative transmission mechanisms of resource extraction on poverty dominate, the most common being LSM encouraging the growth of economic enclaves, corruption, and rent-seeking at the national, regional and local levels (Ferguson, 2005; Idemudia, 2012; Leite & Weidmann, 1999 as quoted in Gamu et al., 2015). Furthermore, the increasing inequality associated with resource extraction has a detrimental effect nationally and regionally, whereas employment volatility has been detected at the local level only (Gamu et al., 2015).

To conclude, macro- and micro-level evidence on the nexus of resource abundance and economic development has yielded mixed insights to date. At the same time, a number of broader criticisms can be made, which are discussed next.

1.3 Unpacking the Shortcomings of Quantitative Studies: The Neglect of Politics and Questionable Assumptions

To underline the relevance of politics and historical context in understanding outcomes of resource extraction, this section begins by briefly discussing the historical trajectory and politics of Tanzania's ASM and LSM sectors over the decades. It shows that political choices shape the nature of distributional outcomes and then goes on to

[19] This paragraph draws on a meta-analysis by Gamu et al. (2015).

highlight the disciplinary divide in existing research. Subsequently, it argues that neoclassical concepts such as methodological individualism and rational choice, problematic as they are, are often applied by quantitative studies but not explicitly discussed.

After Tanzania's independence, Julius Nyerere was hesitant in exploiting the country's mineral wealth in the 1960s and 1970s (Lange & Kinyondo, 2016; McHenry, 1994; Pratt, 1976) but from the 1980s to the 2000s, mining codes were liberalised under the presidencies of Ali Hassan Mwinyi, Benjamin Mkapa, and Jakaya Kikwete (Bryceson et al., 2012; Cooksey & Kelsall, 2011; Lange, 2006). Thus, political aims with respect to resource extraction had shifted substantially towards attracting foreign investment to the country's LSM sector. However, from 2015 onwards, a policy U-turn by the then president John Pombe Magufuli occurred. His government passed legislation favouring ASM and cracked down on foreign LSM companies (Paget, 2017a, 2017c). Some interpreted this policy turn as a 'new resource nationalism', earning Magufuli domestic popularity (Jacob & Pedersen, 2018).

Tanzania's changing political and institutional mining sector landscape over time underscores that a time- and context-specific analysis is required to understand why policies were adopted and how they translated into distinct distributional outcomes for different groups in the extractive sector. As outlined above, neither empirical works applying large cross-country data sets, nor country studies can capture these differences. To this end, a sectoral political economy analysis, linking the interplay of the interests of domestic actors to the adoption of fiscal, monetary and exchange rate policies is necessary (Saad-Filho & Weeks, 2013). Such analysis might help to explain how distinct macro-policies, at their extremes encompassing unregulated capital inflows or export bans, affect distributional outcomes (Saad-Filho & Weeks, 2013). This conforms to Papyrakis' (2017) suggestion that the outcomes of resource extraction are "largely context-specific, depending on the type of resources, socio-political institutions and linkages with the rest of the economy" (p. 1).

Likewise, literature on the effects of natural resources on development is fragmented. A first dividing line exists between an 'economic' and a 'political' branch of scholarship. The former proposes a small number of explanations for resource outcomes, applying large data sets and assuming a high degree of determinism of the outcomes (Ross, 1999; Rosser, 2006). The latter, by contrast unable to provide generalisable evidence given its focus on context, has introduced a variety of

explanations and case studies. Neither school is well integrated with the other, which is problematic. At one end of the spectrum, economists apply quantitative secondary data to explain heterogeneous outcomes of resource abundance such as the works by Sachs and Warner (1995, 2001) and followers.[20] At the other end, anthropologists, political scientists, and geographers have focused on analysing outcomes from a qualitative and context-specific perspective. Examples include Gilberthorpe and Rajak (2017), Hilson and Laing (2017), Banks (2007), and Gilberthorpe (2014), to name but a few.[21]

A second dividing line concerns different scales of analysis. On the one hand, literature on the macro- and meso-scale focuses on cross-country and cross-regional comparisons. This field is mainly dominated by macroeconomists, political economists and political scientists (Badeeb et al., 2017). On the other hand, research adopting a (comparative) case study perspective to scrutinise effects at the household level, is mostly undertaken by social scientists with a focus on qualitative research methods such as anthropologists and geographers (Badeeb et al., 2017). Moreover, it is hardly ever that macro-level results are tested against micro, case-study evidence. This underlines the pronounced fragmentation of scholarship which is visible not only at the macro-micro divide across disciplines but also across the methodologies applied (see Section 1.2).

To begin with, actors are assumed to be rational by most microeconomic studies on the resource curse. For instance, Torvik (2002), assumes that the entrepreneurs in his model are necessarily rent seekers to increase their incomes, while Aragón and Rud (2013) do not discuss how either the individual and/or the household is conceptualised and implicitly assume that actors behave "rationally".[22] Shaped by the marginalist revolution, rational choice theory asserts that any changes in choices and behaviour of economic agents can solely be explained by changes in prices or incomes (Stigler & Becker, 1977). Further, the premise that individuals are rational actors implies that societies consist of utility-maximising economic agents (Fine, 2016) and further implies that individuals are altruistic only if it serves their self-interest (Mattila-Wiro,

[20] For example, Gylfason (2001), Ross (2012, 2001b), Sala-i-Martin et al. (2004), and Sala-i-Martin and Subramanian (2003), to name but a few.
[21] For example, Gilberthorpe and Rajak (2017) emphasise the incorporation of social relations and power in the analysis to "make sense of specific social struggles and political economic trajectories that shape current patterns of resource extraction" (p. 10). Hilson and Laing (2017) examine the Guyanese gold-mining sector, while a number of case studies scrutinise ASM in Papua New Guinea (Bainton, 2008; Banks, 2009, 2007; Gilberthorpe, 2014; Golub, 2007; Hilson, 2006).
[22] Further examples assuming rational choice in Isham et al. (2004).

1999). However, this underexplores the role of collective organisation, for example, in case of the existence of resource rents (Saad-Filho & Weeks, 2013). The existence of such rents might not necessarily result in corruption but could lead instead to collective action to find a common distributional solution. Evidence from behavioural economics suggests that in many instances individuals' actions deviate from what would only serve their self-interest (Fischhoff, 2003; Kahneman & Tversky, 1979; Tversky & Kahneman, 1974). These findings are complemented by Seguino et al. (1996) who, conducting an experiment on altruistic versus self-interested behaviour, found that not only do collective and empathic actions play a crucial role in individual decision-making, but also differ along gender lines.

Moreover, most micro-level studies by economists on the resource curse are grounded in methodological individualism even though the rationale for this is rarely explicitly discussed. Methodological individualism claims that "all theories of social science are reducible to theories of individual human action" (Rutherford, 1994, p. 27). Its proponents attribute structural change, be it institutional or in the structure of the state, either to an individual's actions or to exogenous forces (Milonakis & Fine, 2007). This implicitly assumes that agency precedes structure and that the former is capable of changing the latter (Milonakis & Fine, 2007). One example is the well-known study by Aragón and Rud (2013) on the local impacts of a large-scale gold mine in Northern Peru. Even though the authors highlight that their finding of a positive effect of mining on local incomes is heterogeneous, they remain silent if, and how, the structural position of individuals shaped these income effects.

In contrast to studies informed by methodological individualism, research informed by methodological holism gives primacy to the social whole, at the expense of possibly disregarding individual and collective agency (Milonakis & Fine, 2007; Rutherford, 1994). Both methodologies bear the risk of under- or overemphasising the role of agency or structure, respectively. Overcoming this dichotomy might be achieved by following Milonakis and Fine's (2007) conceptualisation of methodological structurism, as championed by Lloyd (1986). Here, an individual's ability to exert agency is conceptualised as conditioned, but also enabled, by structural and historical context. Even though structure is understood as preceding agency in this framework, agency is seen as an important factor in historical change (Lloyd, 1986).

Thus far, I have criticised how individuals are conceptualised in orthodox microeconomic studies on the local resource curse. Building on this, the analysis now

turns to a broader discussion of how households are conceptualised in this branch of literature. Contributions by mainstream economists conceptualise households as rationally-behaving units. Here, rationality means that market mechanisms determine how the household values consumption and production of goods relative to time. Yet non-rational factors such as social and cultural norms also affect the consumption and production norms of goods adopted by a household. In neoclassical works, the assumption of rationality led to conceptualising households as unitary.

This unitary model draws heavily on Becker's (1965) new household economics (NHE). Building on neoclassical consumer theory, in this framework, decisions by the household are understood as the maximisation of a set of utility functions with identical preferences for each household member (Mattila-Wiro, 1999). Thus, NHE assumes that a household's resources are pooled and that a single utility function represents the entire household. In the altruistic family each individual is assumed to behave altruistically, while agents are conceptualised as utility-maximising in the outside world.

In contrast with this approach, research has shown that intra-household allocation of resources takes place across competing ends and is negotiated through unequal power relations (Agarwal, 1997; Folbre, 1986; Mattila-Wiro, 1999). In particular, the role of gender and caring tasks and the ways in which these obligations differ between members of the household are underexplored (Bergmann, 1995; Ironmonger, 1996). This matters, as anthropological research has shown that the outcomes of household bargaining processes are shaped by gender roles, and findings by economists highlight that females spend incomes and distribute resources differently to men (Kabeer, 1998). Yet, most works on the household-level implications of the effects of resource extraction fail to account for these complex and distinct outcomes within the household.

Finally, as discussed, classical political and structuralist economists have paid close attention to a country's external environment and how its politics and historical context shape the impact of resource extraction on development. In contrast, we have seen that studies in the tradition of Sachs and Warner underexplore the reasons behind distinct developmental outcomes and how they are shaped by the different types of extractive sectors, institutional settings such as power, social relations, and context. Thus, integrating sectoral politics and history is paramount to understanding distributional outcomes of resource extraction at the household level. This underlines the need to combine case study evidence with an integrated analysis of politics and

social relations to scrutinise how they shape and transmit local outcomes of resource abundance.

To conclude, the dichotomous understanding of resource extraction as either a blessing or a curse is not helpful in explaining the range of heterogeneous outcomes. Consequently, more empirical context-specific evidence is needed, as outlined by various scholars such as Cust and Poelhekke, (2015), Gamu et al., (2015) and van der Ploeg and Poelhekke (2017). Heeding this call, the next section examines a specific type of resource extraction in the Global South, artisanal and small-scale mining, and its impact on a specific dimension of development, poverty. To this end, the next section discusses empirical country-specific household-level findings of the effects of ASGM by focusing on poverty reduction. It starts by presenting debates in the ASM literature with particular attention to how scholars and policy makers have understood the role of ASM and its nature.

1.4 Artisanal and Small-Scale Mining and its Effects on Poverty

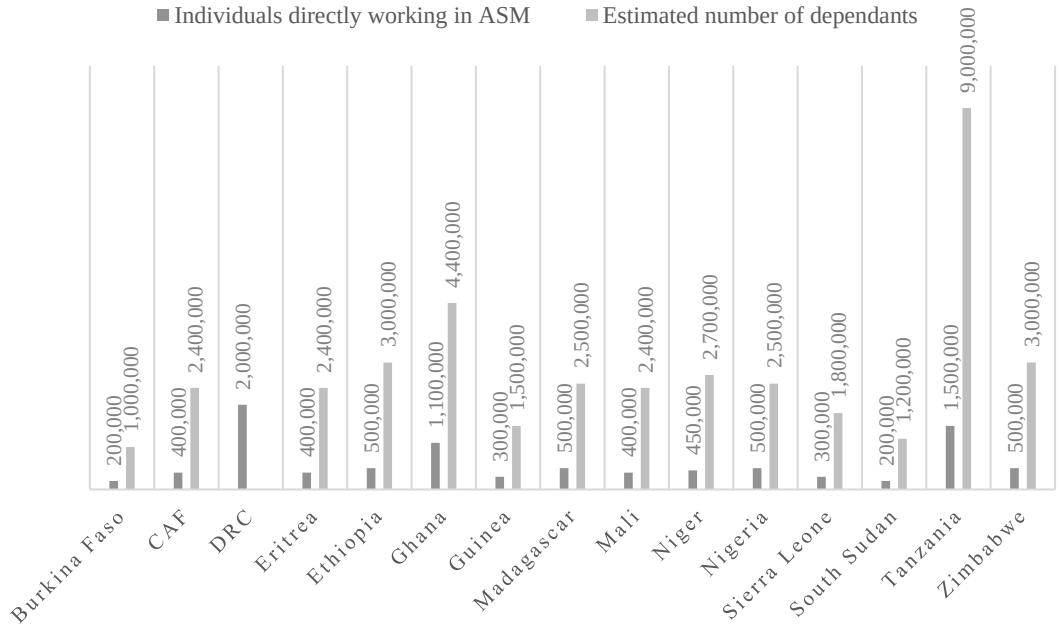
1.4.1 Changing Scholarly Debates

Contracting markets for crops and deteriorating terms of trade for African smallholders resulted in a search for alternative incomes in the form of non-farming related employment (NFRE). This development has led to an income-earning reorientation, social re-identification, and spatial relocation away from solely agriculture-based rural livelihoods (Bryceson, 1996). As one consequence of this 'de-agrarianisation', many hard-pressed households in rural SSA started engaging in ASM (Bryceson, 1997, 2000).[23] As highlighted in Figure 1.2, across sub-Saharan Africa, Tanzania's ASM sector stands out: it has the second largest small-scale labour force across the subcontinent (1.5 million people) and the largest number of estimated dependents (approximately 9 million people) (UNECA, 2011). Given the sector's relevance, not only in SSA but also in the Global South, scholars have been debating ASM's nature and relevance over the last four decades (Hilson & McQuilken, 2014), interpreting its potential for development differently (Banchirigah & Hilson, 2010).

[23] Prior to the Delve project by the World Bank and Pact, the Communities and Small-scale Mining (CASM) initiative was, until 2012, the ASM flagship project of the World Bank. Its archive can be found at http://artisanalmining.org/.

Figure 1.2

ASM Populations in SSA



Note. Sources: Delve (2020); Hilson (2016, p. 548); The Artisanal and Small-scale Mining Knowledge Sharing Archive (2018). CAF stands for Central African Republic while DRC stands for Democratic Republic of the Congo. For the DRC no data on the number of dependants was found.

In the late 1980s, Noetstaller (1987) authored the World Bank's influential *Small-Scale Mining: A Review of the Issues* report which set the scene for how the sector would be perceived by both scholars and policy makers for the next decade. Noetstaller's characterisation of ASM as populated by entrepreneurs looking for rapid investment returns and business opportunities shaped its "get-rich-quick narrative" (Hilson, 2011, p. 1033). It further suggested that rural workers enter and exit ASM at will, predominantly drawn by the lures of high one-off incomes. This view of ASM as entrepreneurially-driven has been criticised by Chachage (1995), as workers were assumed to be "a homogenous group with similar economic and educational backgrounds" (p. 72) and, in so doing, existing socio-economic differentiations within ASM were neglected and "actual relationships [..] in the mining communities and between these and wider social, economic and political forces and institutions" (p. 72) were underexplored. The view prevailed until the World Bank's *International Roundtable on Artisanal Mining* in the mid-1990s (Hilson, 2011, p. 1033).

The 'get-rich-quick narrative' was grounded in the 'demand-pull school', which contends that rural households are branching out of agriculture into ASM to diversify

their incomes in search of greater economic returns (G. Hilson, 2009). According to this school, the process of income diversification towards ASM is voluntary but driven by the lower risk and higher returns available outside of farming. ASM is described as a rush-type activity, driven by entrepreneurial spirit, and primarily seen as a site of rural accumulation (Havnevik et al., 2007; Noetstaller, 1987).

The World Bank's position on ASM and its nature shifted diametrically in the mid-1990s. Summarising the proceedings of the Bank's influential *International Roundtable on Artisanal Mining*, Barry (1996) concluded that "to a large extent, informal mining is a poverty-driven activity" and "as a poverty issue … must be addressed by a comprehensive approach" (p. 1). Thus, a paradigmatic shift in reconceptualising poverty, rather than entrepreneurship, as ASM's major driver occurred (Hilson, 2009). This shift has to be seen in the broader context of a changing development finance landscape in the 1990s and 2000s, as donor attention turned towards combatting poverty, most visible in the World Bank's shift from the Washington to the Post-Washington Consensus. Moreover, as a consequence of this changed paradigm, scholars began to challenge the validity of the demand-pull argument as an explanation for the shift in livelihood orientations towards ASM. Now, escaping extreme poverty and financial precarity became the main argument why people engaged in ASM (Hilson, 2009).

Consequently, the 'distress-push school' emerged, which conceptualises ASM mainly as a site of survival.[24] Increased population growth leading to scarcity of land, a decline in agricultural productivity and returns, a lack of access to farm inputs, temporary negative external shocks, and the absence of access to rural financial markets were factors frequently named as explanations for pushing households into ASM activities, and NFRE more generally (Hilson, 2010). Based on empirical evidence, scholars today tend to support the distress-push narrative of ASM as being driven by agricultural poverty.[25]

Having outlined these distinct theoretical explanations for the surge in ASM activities, scholars have argued that a further reason for growing informal ASM activities was the adoption of structural adjustment programs (SAPs) (Hilson &

[24] This relates to some extent to a debate on agrarian change, where the distress-push school is also found under the 'too poor to farm' argument while the former, the demand-pull school, is summarised under the 'too busy to farm' argument (Bernstein, 2010b).
[25] This is supported by evidence on the DRC (Perks, 2011), Ghana (Hilson, 2010), and Zimbabwe (Kamete, 2008).

McQuilken, 2014). From the mid-1980s, SAPs led to reforms of mining codes to lure foreign investors through generous tax breaks (Banchirigah, 2006; B. Campbell, 2003) and adopting SAPs brought about two developments with respect to mineral extraction. On the one hand, it instigated the liberalisation and growth of LSM in many parts of SSA. Attractive legislation allowed foreign companies to repatriate profits while paying only small royalties and exporting equipment, resulting in little benefits for mineral-rich economies (Banchirigah, 2006, p. 166). Lange (2006) reports that in Tanzania, between 1998 to 2002, on average only 8.4% of the exported gold's value was accrued as tax revenues by the government, while Chachage (1995) contends that SAPs led to a strengthening of accumulation for foreign LSM companies.

On the other hand, SAPs engendered increased informalisation of ASM (Hilson & McQuilken, 2014). Country evidence on Ghana (Hilson & Potter, 2005), Zimbabwe and Tanzania (Dreschler, 2001) suggested that SAPs had detrimental impacts on formal urban jobs in the form of job cuts, leading to a surge in informal ASM activities in rural areas (Banchirigah, 2006; Hilson & McQuilken, 2014). For Tanzania, Wuyts (2001) reported that structural adjustment translated into a surge in informal activities in the 1990s – particularly activities related to small-scale gold and tanzanite mining (Raikes & Gibbon, 1996). This was echoed by Mondlane and Shoko (2003) who reported a similar development in Mozambique; they contend that SAPs in 1986 left many workers unemployed, and that this, in combination with droughts, led to a bourgeoning ASM sector in the early 1990s. In an environment of deteriorating urban employment conditions, the search for a career in ASM became a strategy to survive in an environment of de-agrarianisation (Hilson & McQuilken, 2014).

Scholars' different understandings of the reasons behind a surge in ASM activities accompanied their antithetical positions regarding the sector's economic role. On the one hand, ASM was assumed to provide supplementary income and to be of a *seasonal* nature (Hilson & Garforth, 2012; Maponga & Ngorima, 2003). Thus, changes in rural employment patterns were perceived as a temporary flight into ASM to escape poverty. According to this view, there is no long-term structural transition towards ASM and farming remains the most salient economic rural activity (Banchirigah & Hilson, 2010). On the other hand, there are scholars who suggest that ASM is more than just a "rush activity"' (Hilson, 2009, p. 3) and instead is deeply rooted in rural societies (Childs, 2008; Fisher et al., 2009; Kambani, 2003; Keita, 2001). Given its low entry barriers, it is perceived as a viable channel to alleviate poverty and to decrease

vulnerability to negative external shocks. According to this camp, ASM is structurally replacing farming (Banchirigah & Hilson, 2010).

Nowadays, the debate is more balanced, pointing out that ASM and agriculture are linked – for example, Pijpers' (2014) ethnographic research in Ghana, Sierra Leone, and South Africa as well as the contribution by Maconachie and Binns (2007) on Sierra Leone. Both emphasise that land use concerning both activities is intertwined but also highlight that this can be a source of potential conflict. Having outlined these scholarly debates, the next section discusses the evidence of the effects of ASM on poverty and labour dynamics in Tanzania.

1.4.2 ASM and its Local Effects on Poverty: Zooming In on Tanzania

Empirical case studies draw a fragmented picture of the socioeconomic impact of ASM. On the one hand, studies have found that ASM reduces poverty (Fisher et al., 2009; Kamlongera, 2011), generates above-average cash incomes (Bryceson et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006; Merket, 2019; Pokorny et al., 2019), alleviates hardship and increases food security (Hilson et al., 2013), and strengthens local linkages (Bazillier & Girard, 2017). On the other hand, evidence also shows that ASM impedes poverty reduction. Scholars have reported that miners are unable to accrue savings and that their incomes cover daily needs only (Adu et al., 2016; Hilson & McQuilken, 2014; Werthmann, 2003), that workers find themselves in a poverty trap (Banchirigah, 2008), that ASM does not improve the quality of life (Heemskerk, 2003), and that it has high ecological costs (Obiri et al., 2016; Schueler et al., 2011). Given these contrasting findings, the following paragraphs engage with the most important and cited studies in more detail.

Empirical evidence by Fisher et al. (2009) provides a starting point to analyse the effects of ASM on poverty in Tanzania.[26] Surveying three villages in northwest Tanzania, they found that ASM was either the most, or second-most important income-activity.[27] Based on a household survey (n=291) and on a probit analysis, their main finding was that households engaged in ASM, or ASM-related activities, are less likely

[26] The dataset is an extension of Mwaipopo et al. (2004) who gathered quantitative and qualitative data. The three case study sites – Makubi, Nyarugusu and Mgusu – are all located in Geita Region, but which in 2004 were part of Mwanza Region. Mabuki is known for its diamond mining, while Nyarugusu and Mgusu are both ASGM settlements.
[27] Excluding children under the age of 16 and people with a disability.

to be exposed to extreme poverty and vulnerability. They further reported that ASM households were less likely to experience food shortages and serious sickness and that informality, and the inability to obtain a formal mining licence, jeopardises poverty reduction. With respect to processing tasks, such as the reprocessing of tailings and crushing stones, they suggested that these ASM incomes are preferable to other sorts of incomes, given they guarantee a regular income.

Fisher et al.'s study explored the abilities, but also limitations, of ASGM to reduce poverty but falls short of discussing methodological aspects. Despite the fact that they included a qualitative wealth assessment to further the results of monetary poverty metrics, they abstained from discussing the problems related to monetary measures (Fischer, 2018; Saith, 2005). For instance, applying a national consumer price index is built on the assumption that the costs of living in urban areas and the respective food basket are transferable to rural settings. Fisher et al. (2009) followed this approach but this is problematic for a number of reasons. First, price levels differ across urban and rural settings. Second, in many countries with substantial numbers of people living in poverty, a clustering around the cut-off threshold of who is considered to live in such a state occurs (Fischer, 2018). Third, poverty levels are sensitive to changes in goods consumed and price levels, both of which can inflict bias (Székely et al., 2000).

Furthermore, Fisher et al. (2009) are silent on stratification in the sector. Their key finding on stratification is that the impact of ASM on poverty and on vulnerability depends on the socio-economic and spatial position of a household. For instance, they found that holding a Primary Mining Licence (PML) makes it less likely that the worker would be exposed to food poverty. However, they do not discuss how different types of jobs in the sector, and access to them, possibly confined by social and power relations, might lead to distinct labour market outcomes for workers. Fisher (2008) partly fills this gap by elucidating on the practices of ASM and providing oral histories of a successful mining entrepreneurs but does not add for whom it does not work, and why, to the picture.

Turning towards the local impact of ASM in Tanzania, and its interaction with other livelihood activities, evidence is scant. As outlined previously, resource extraction might potentially harm livelihoods by exerting a local resource curse. Bryceson and Jønsson (2014) argued the opposite to be the case, as ASM "averts the pitfalls of the mineral resource curse … boosting labour absorption in national economies, raising purchasing power and enhancing the multiplier effect in local

economies" (p. 1). Yet, for Tanzania, their positive claim has limited grounding in empirical evidence. Similarly, Mwaipopo et al. (2004) reported that ASGM contributes to economic growth of the local economy at the individual and household level in northwest Tanzania, without being able to quantify these effects.

Having outlined the lack of empirical evidence on the effects of ASM on poverty in Tanzania, the discussion briefly turns towards another ASM hotspot where evidence on this nexus is rich, Burkina Faso. For this West African country, Bazillier and Girard (2017) found that households living close to ASGM mines consumed 15% more during an artisanal mining boom, whereas no such increase was found in the case of industrial mining.[28] Their findings are confirmed by Pokorny et al. (2019), who reported that the livelihoods of households near industrial mining areas are not affected positively, whereas artisanal mining generates cash incomes and job opportunities. Speaking to this, Jaques et al. (2006) estimated that around 64% of Burkina Faso's total ASGM revenues is spent onsite and directed to local pit-side producers. This highlights that the impact and existence of local linkages ought to be analysed in their context.

To conclude, the main arguments of this chapter are three. First, understanding the macro-level effects of resource extraction on the economy necessitates integrating context and politics into the analysis. Thus, second, context-specific research is necessary to scrutinise specific outcomes. Heeding this call, the chapter has focused on a specific form of resource extraction and its socioeconomic implications: the effects of ASGM on poverty. Third, evidence on sectoral poverty reduction is mixed and the heterogeneous outcomes for actors linked to the sector are underexplored to date. For this reason, the next chapter links this discussion on the impact of resource extraction on the household to another branch of scholarship: the literature on informal and rural labour markets. In so doing, the hypothesis that the role of labour markets has been underexplored in research on the impact of ASM on poverty is presented.

[28] It is estimated that the 2009–14 gold mining boom, on average, increased consumption by around 5 cents per person per day in ASM households. Given that on average 50 cents were spent daily, this represents an economically meaningful increase (Bazillier & Girard, 2017).

2 Rural Labour Markets: An Entry Point to Analyse ASM's Impact on Poverty

> Our understanding of ASM would benefit tremendously from more central attention for [sic] the role and anatomy of informal labour markets in the sector… More explicit attention should be devoted to understanding the heterogeneity of the ASM-sector, and its ability to act as a platform for wealth creation and social emancipation … This … implies paying more attention to the role and anatomy of labour markets, including the way they are structured by wider sets of social relations.
>
> (B. Verbrugge, 2016, pp. 109, 114)

> Analyses cast very little light on, inter alia, who is financing activities and … which groups of actors are potentially trapped in poverty. The answer to these questions lies in how unlicensed miners are organised.
>
> (Hilson, 2012, p. 184)

The chapter argues that scrutinising ASM labour markets allows an analysis of for whom the sector reduces poverty, and for whom it does not, and why this is the case.[29] The first quote by B. Verbrugge suggests that analysing ASM labour markets in more detail might allow to examine distributional outcomes, for whom the sector reduces poverty, and for whom it does not, more thoroughly. However, as highlighted by the second quote, knowledge of how the type of ASGM activity shapes distributional outcomes, and thus impact poverty, is limited. This reflects a gap in the broader literature in which the link between rural labour and poverty is underexplored (Oya & Pontara, 2015). For this reason, the chapter links scholarship on informal, rural labour markets and their labour relations to the ASM literature.

[29] Most researchers, for example, Oya & Pontara (2015), apply the term *labour relations* to describe the continuum of waged and self-employed income activities. This thesis avoids the term, arguing that own-account, self-employed work is not characterised by a social relation to another person and thus is better described as being an employment status than a labour relation. The thesis thus deploys the term *employment status*.

The chapter's first section discusses different economic schools of thought and how they conceptualise labour and its markets. Subsequently, the analysis turns more specifically to rural and informal labour markets. The chapter begins by analysing ASM labour markets. The chapter reveals that the social and power relations in ASM labour markets, and how they affect socioeconomic outcomes such as poverty, are insufficiently addressed in the existing literature. In so doing, it discusses the need to scrutinise distinct ASM labour relations, the types of jobs, and income patterns. The chapter concludes by outlining the research gap that this thesis aims to fill.

2.1 Labour Market Theory

How are labour and its markets conceptualised in economics? In neoclassical microeconomics, labour is conceptualised as a commodity no different to any other (Pontara, 2010). Consequently, neoclassical accounts of the labour market understand the relation between wages, supply and demand as a functional form where the classic market-clearing model applies (Fleetwood, 2006).[30] Consequently, a labour market reaches equilibrium when the amount of labour supplied equals the amount of labour demanded (Fields, 2007). This equilibrium state in labour markets is based on a set of market clearing conditions. Drawing on Fields (2007), first, firms can hire as many workers as they want. Second, workers are able to move freely from one labour market to another. Third, wages received by workers depend on the supply and demand of labour.[31] Over time, a number of refinements to this market-clearing model were made,[32] some of which are outlined in the next paragraphs.

As a first deviation from the orthodox understanding of labour markets, the dual labour market (DLM) approach surfaced in the early 1970s. The dual approach acknowledged the peculiarities of labour as a commodity – such as the incentives to increase job security contradicting the employer's incentives (Fine, 1998) – and linked these imperfections to the existence of a dual labour market. DLM theory argued that

[30] Its formalisation in the form of the partial equilibrium diagram is not discussed here, see Pontara (2010) for a summary.
[31] The labour supply can be derived from the marginal productivity of labour and the marginal utility of leisure combined with the maximisation over other decisions (Fine, 1998).
[32] Further theoretical advances entailed the introduction of efficiency wage theory, asserting that a higher wage increases a worker's productivity, and human capital theory which argued that workers are rewarded according to their skill level while variables such as socioeconomic background, gender and ethnicity are of secondary importance (Craig et al. 1982). Furthermore, models of labour market discrimination claim that prejudices affect employment choices which is linked to the idea of internal labour markets.

there is, on the one hand, a primary sector with preferential employment conditions, containing a well-developed internal labour market and, on the other hand, a secondary sector with insecure work conditions and absent internal promotion possibilities (Fine, 1998). DLM scholars assumed a low level of mobility between the two sectors.

Taking the theory of DLMs a step further, the Cambridge school of segmented labour markets (SLM) not only emphasised that labour, as a commodity, is heterogenous but also introduced class conflict into the analysis. SLM theory contends that different qualities of the same job might exist in different labour markets at the same time. The Cambridge school added to this that labour markets are structured and restructured individually on the demand and supply sides (Fine, 2016). Structural characteristics on the demand side can be characterised by a labour market's capital intensity, technological aspects, and degree of mechanisation as well as the scale and competitiveness of the firms involved (Fine, 2016). On the supply side, structural characteristics are a worker's individual skills but also their relative economic and social position, as they shape if, and to what degree, they succeed in the labour market (Fine, 1998, 2016). Moreover, the Cambridge school breaks with human capital theory. It analyses how demand and supply coming together creates conflict, given their contrasting interests of labour and capital (Rubery, 1978) and it particularly emphasises not only the role of social and economic forces, but also that of the state and the family in this (Fine, 1998). Even though its empirical orientation contains the analysis of structure, social dynamics, and institutions, the Cambridge school is criticised for its lack of grounding in more abstract political economy categories (Fine, 1998). One stream of theory, which aims to acknowledge history and politics in the study of labour and the structure of its markets, is Marxian scholarship.

For these scholars, labour market structures are shaped by historically contingent factors. Examples might be either the privatisation or nationalisation of parts of the demand side of a labour market, or specific policies to augment or weaken the bargaining power of trade unions. Moreover, they argue that labour market structures are also shaped by social relations such as gender, race, or class, restricting access to parts of the labour market. Marxian economists argue that labour markets are not only externally but also internally differentiated and structured. In this regard Fine (1998) noted:

> Labour markets are not only structurally differentiated from one another in the limited sense of being separate or divided, but that they are internally structured

> in different ways. In other words, underlying socioeconomic determinants endow particular labour markets with particular labour market structures, relations and processes attached to their reproduction and/or transformation. (p. 251)

Labour markets can be differentiated further by vertical and horizontal determinants (Fine, 1998). The former refers to determinants that exist in a particular labour market only, for instance the contracting out of data services in the labour market for data scientists. Horizontal determinants prevail across all labour markets in an economy such as income differentiation by skill, education or gender prevails. Having outlined these different analytical entry points to the analysis of labour market structure, next the discussion turns towards how labour is conceptualised by Marxian theory.

Marxian economists, in contrast with neoclassical scholars, contend that labour cannot and should not be conceptualised as a commodity. They argue that the labour market differs from any other market, as workers are inseparable from the good they are selling: labour. Even though labour be represented indirectly, for example, through trade unions, its sale is intimately linked to the individual and cannot be separated from him/her (Fine, 1998). This is unlike any other commodity market, where, in contrast to labour, a commodity cannot play "an active role in its own sale" and does not have "feelings about the terms and conditions" of the transaction (Fine, 1998, p. 254). Given this direct link, an individual's agency is inseparably linked to the process of selling labour. This contrasting understanding of labour and its markets is based on a set of social properties, which are argued to be specific to labour.

First, Marxists argue that instead of 'labour', the 'capacity to work', also known as labour-power, is bought and sold (Fine, 1998, 2016). Given that labour is physically linked to an individual, labour itself can neither be bought nor sold. Instead, an individual's capacity to work becomes the tradeable commodity. Given its tradability, the value of labour-power can be defined as "the equivalent in labour-time which is paid for the capacity to work" (Fine, 1998, p. 257). Capital owners make profits when they manage to remunerate workers' labour-power below the value that their labour force contributes (Fine, 1998). This difference constitutes the surplus value in Marx's writings. Thus, labour as a 'commodity' can "create more value than it does itself command in exchange" (p. 257). Second, Marxian theory abandons the idea that labour market outcomes are the result of a market equilibrium. Instead of understanding labour market conditions and outcomes as the outcome of an efficient and harmonious process

of invisible forces, they argue that the structural position which workers find themselves in, matters (Fine, 1998).

To conclude, the above has highlighted that neoclassical labour market theory conceptualises labour markets as monolithic, mechanically reaching an equilibrium outcome. Heterodox approaches such as the SLM and Marxian schools break with this understanding and emphasise the relative economic and social position on the supply side and the structure of the demand side of the labour market. The thesis particularly acknowledges the necessity to analyse these structural features on the supply side, analysing the structure of employment statuses and the types of ASGM jobs. It draws on Marxian labour market theory to examine the ways in which individual labour markets are not only externally historically and socially specific, but also internally characterised by distinct socioeconomic determinants. Having outlined these theoretical underpinnings, the next section engages with academic debates on rural labour markets.

2.2 Rural and Informal Labour Markets: Contrasting Truths

The orthodox narrative is that rural labour markets in the Global South are "thin or absent" (Oya, 2013, p. 252) and characterised by a high degree of self-employment.[33] A well-known study representing this view is that by Binswanger et al. (1989) on African agriculture. They found that "there is no locally resident labour class" and consequently "almost no hiring or exchange of labour among resident farmers during the peak labour season" (p. 125). For them, rural labour markets were inactive. One contribution, which partly defends this classic view and partly diverges from it, is Reardon's (1997) analysis of 25 country case studies. On the one hand, Reardon breaks new ground, as he reported that non-farming related activities contributed around 45% of rural household incomes. Within this NFRE, waged labour was twice as important as self-employed activities in Botswana, Kenya, Malawi and Zimbabwe. On the other hand, Reardon suggested that the prevalence of agricultural wage work was much lower

[33] Rural labour markets played a negligible role in IFI flagship reports such as, for instance, the World Bank's 2013 World Development Report (WDR) (World Bank, 2012) and are under-reported by national statistical offices in developing economies (Backiny-Yetna, 2003). This is surprising, as the 2007 WDR tells a different story, emphasising that "making the rural labor market a more effective pathway out of poverty is thus a major policy challenge that remains poorly understood and sorely neglected in policy making." (World Bank, 2007, p. 22). Nevertheless, the 2013 WDR reiterates that in rural, agrarian economies "wage employment is not the prevalent form of work" (World Bank, 2012, pp. 190–191).

than that of self-employment, and thus conformed to the orthodox narrative according to which agricultural wages constitute an insignificant share of rural incomes.

Both contributions, enhanced by related works and applying secondary data from labour force surveys, suggest a number of stylised facts of how rural labour markets are constituted. First, that the majority of rural households are pursuing self-employed farming activities, mostly producing and consuming their own goods (Sender, 2003). Second, that subsistence smallholders are a homogenous group (Sender, 2003). Third, that most households living in poverty cannot access waged employment and those who engage in off-farm waged labour are usually not living in poverty (Cramer et al., 2008).

The validity of this orthodox narrative is questioned by heterodox scholars. Their research highlights the significance and heterogeneity of rural labour markets and of waged activities in rural areas. There are country case studies covering Mauritania and Senegal (Oya, 2013, 2015), Tanzania (Mueller, 2011, 2015; Rizzo et al., 2015), Mozambique (Cramer et al., 2008), Rwanda and Ethiopia (Petit & Rizzo, 2015), and Botswana, Lesotho, and Eswatini (Johnston, 2015), to name but a few.[34] Almost all of them deploy original primary data, and contend that existing labour survey data suffer from serious methodological and conceptual shortcomings. These methodological shortcomings, which will be discussed later on in this chapter, are argued to have led to a biased understanding of rural labour dynamics in the Global South.

By integrating economic and social context in the design of questionnaires, these empirically grounded studies challenge the orthodox narrative and propose an alternative set of facts concerning the nature and prevalence of rural labour markets. First, the most materially deprived households hold neither enough land nor productive assets to make ends meet. As a consequence of this, second, a large fraction of rural households engage in heterogeneous forms of not only agricultural, but also of non-farm waged employment (Oya & Pontara, 2015). It comes as no surprise that the most deprived rural households are particularly likely to engage in casual and seasonal waged labour (Cramer et al., 2008). Further, both of their findings stress the existence of a marked heterogeneity of labour agreements, translating into intricate remunerative patterns across distinct sectors and employers (Cramer et al., 2008; Oya & Pontara,

[34] Further contributions were made by Cramer et al. (2014a), Mueller and Man-Kwun Chan (2015), Oya (2010), Oya and Pontara (2015), Pontara (2010), Rizzo (2011b), and Sender et al. (2006).

2015). All this, they contend, in stark contrast with the orthodox narrative, makes waged employment central to the lives of the poorest in rural areas. Consequently, according to them, the analysis of employment statuses and their implications is vital to understanding and transforming rural poverty dynamics.

Given this wage-poverty nexus, heterodox scholars argue that the analysis of employment status is an important step in understanding poverty outcomes. Yet, research on poverty is nowadays delinked from that on employment creation and "knowledge of rural wage employment and how it relates to rural poverty is exceptionally limited" (Oya, 2013, p. 252). This "divorce" (Oya & Pontara, 2015, p. 5) concomitant with a "dementia over jobs" (Amsden, 2010, p. 4) limits our knowledge of how rural labour markets ought to be targeted. Ideally, lower-skilled tasks, currently casual and piecework, should be upgraded to more secure waged – and regulated – activities. More secure waged jobs are thought to be linked to higher productivity activities and to structural dynamic transformation. As such, they are suggested as the most promising way to reduce poverty (Amsden, 2010; Oya & Pontara, 2015). This is supported by empirical findings, highlighting that the degree to which the poorest strata of rural populations are able to escape poverty is strongly linked to the quantity and quality of waged labour in which they engage (Oya & Pontara, 2015).[35]

The heterodox camp further argues that which type of employment status individuals hold shapes their constraints and opportunities (Mueller & Man-Kwun Chan, 2015). Thus, an empirically grounded understanding of the relative prevalence of distinct employment statuses is vital to design impactful policies. The following example reinforces their argument. A waged miner requires the stricter enforcement of labour regulations, better working conditions, and higher, more predictable wages, for example, through a minimum wage floor. In contrast, a self-employed miner needs better access to finance, technical and business training schemes, and the provision of inputs (Mueller & Man-Kwun Chan, 2015). Thus, the type of employment status shapes the type of policy support needed. However, the knowledge base on employment relations in ASM labour markets is scant, for reasons that will be explored next.

[35] With regard to structural transformation, Amsden (2010) contends that donors and policy makers were taking "Say's law" at face value, by assuming that improving the quality and quantity of labour supply would naturally lead to increases in labour demand (p. 4). Say's Law goes back to Jean Baptiste Say, a French classical economist, who argued that supply creates its own demand. Assuming full employment, he contended that what would be produced in an economy would also be purchased (Amsden, 2010).

The reasons behind the paucity of rural labour market data over the last decades for SSA have been highlighted by existing works (e.g., Mueller, 2015; Oya, 2015), and the World Bank has acknowledged the scarce knowledge base concerning rural waged activities (World Bank, 2007, 2012). This "invisibility of waged labour" (Rizzo et al., 2015, p. 151) has a number of reasons. To begin with, one reason is the strong focus on income and expenditure surveys in the last decades at the expense of labour force surveys.[36] Labour market surveys are among the least frequently conducted statistical inquiries (Rizzo et al., 2015), whereas income and expenditure surveys, pushed by donor agendas, have been on the rise since the 1980s (Oya, 2013). An example of the latter is the frequently conducted Living Standards Measurement Surveys (LSMS) which assess households' budgeting (Sender et al., 2005). Thus, there is a strong paucity of labour market data for sub-Saharan Africa (Jerven, 2013) while knowledge of temporal waged activities is particularly scant. This is emphasised by Sender (2003):

> In most developing economies no efforts at all are made to collect time-series data on the wages of those employed in small-scale farm and non-farm rural enterprises, especially on the wages of those who are irregularly, seasonally, or casually employed. In most of these economies, in fact, there is no reliable data on the number of people or households that depend upon earnings in these types of employment; it is simply assumed that the rural poor are, or will, become self-employed. (p. 418)

This is exemplified by the World Bank's frequently conducted Living Standards Measurement Surveys (LSMS) which assess households' budgeting (Sender et al., 2005). Slightly putting Sender's critique in perspective, national labour force surveys in Tanzania were conducted relatively frequently, roughly every eight years. Yet, they lack quality (Rizzo et al., 2015), as censuses in SSA are often outdated, which limits their explanatory power (Sender et al., 2005).[37] Additionally, there is a lack of well-trained personnel which also affects both the accuracy and availability of reliable survey data (Jerven, 2010).

[36] As pointed out by Johnston (2015), Oya (2013) and Sender et al. (2005).

[37] A somewhat similar point regarding the data quality covering economic activities in SSA countries is made by Jerven (2015). He contends that the base years of national accounts of many SSA economies – amongst them some of the continent's largest such as "the DRC, Nigeria and Sudan" (pp. 107–10) – are outdated and hence distort GDP estimates dramatically. A similar criticism, given the infrequent data on poverty in SAA and thereby missing data points, concerns the validity of cross-country regressions assessing poverty.

Alongside the lack of both quality and quantity of rural labour market data, a more general decline in research on rural differentiation occurred. This broader abatement of scholarly focus on the political economy of agrarian change led to increased research efforts centred around smallholder farming and agricultural reforms (Oya, 2011). Academic research and institutional funding constraints have led to a focus on "economic growth, health and education" (Oya & Pontara, 2015, p. 5) to fight deprivation, to the point of disregarding labour as an important dimension of analysing and tackling poverty.

A second reason is the reliance on employment categories which are derived from OECD economies without acknowledging that context-specific translations and solutions are needed. Applying such labour modules and conventions is argued to underexplore the existence of, and heterogeneity in, these labour markets (Cramer et al., 2008; Standing, 2006); given the informal environment and economic insecurity, the distinct manifestations of waged labour in SSA are underexplored (Oya, 2013; Rizzo et al., 2015). More specifically, Rizzo et al. (2015) contend that problems arise when translating key concepts from English into local languages which can – and has – caused a misunderstanding of context-specific, culturally-loaded terms during labour force surveys. For rural Senegal, Oya (2015) outlined that enumerators were applying the term *salaire* which left respondents thinking of "higher-status, stable, formal sector jobs" and hence inflicts an underestimation of waged labour (p. 53). Similarly loaded terms were applied in Tanzania's labour force surveys, one example being *ajira*, referring to waged labour that is not informal being used when asking about informal labour (Rizzo et al., 2015). Moreover, Mueller (2011, 2015) pointed out that in Tanzania the term *kibarua* has a strong negative connotation, as it is often associated with past forms of forced labour and is now associated with casual labour, often characterised as rather insecure and hard manual work.[38] The interplay of *ajira* and *kibarua* has resulted in a narrow working definition of waged labour, while self-employed activities were translated into "extremely loose terms" as "work that is not agriculture" (Rizzo et al., 2015, p. 10). Consequently, wage-employed was often misinterpreted as self-employed activities in the past (Rizzo et al., 2015). This outlined

[38] The term was initially coined in the context of the slave trade during early colonial days. It was a "slip of a paper or card" carried by enslaved workers when working on the docks, indicating who was their owner (Eastman, 1994, n. 6).

context-specificity renders probing techniques during interviews particularly important (Mueller, 2015).

A third reason is that most large-scale labour force surveys champion the methodological choice of considering the primary job only, leaving an array of income-generating activities as well as temporary and seasonal workers (Johnston, 2015; Oya & Pontara, 2015) out of the picture. In doing so, the "occupation multiplicity" (Oya & Pontara, 2015, p. 13) in rural areas of developing economies is underexplored and the existence of "large numbers of casual workers" (World Bank, 2007, p. 205) is not accounted for. Understanding the entire range of rural employment statuses, however, adds analytical depth, as for example Oya's (2015) findings on waged labour arrangements in Senegal's groundnut basin illustrate. Looking at the agricultural sector, Oya (2015) differentiates between its segments of labour tenants, seasonal wage workers, casual wage labourers, labouring migrants and reciprocal labour arrangements, among others. As knowledge of rural labour markets of NFRE is as scarce as that of its agricultural counterparts, and possibly subject to similar misconceptions, analysing employment statuses in ASM in more detail is salient. Having discussed a number of reasons for the limited quality and scantness of labour market data in the Global South, the following section examine empirical research and how these findings fed into the development of the thesis's research question.[39]

2.3 Empirical Evidence on Rural Labour Markets From Small, Context-Specific Surveys

The previous section discussed the reasons why large-scale labour surveys have yielded contrasting results compared to small, context-specific case studies. To examine these differences more closely, the following paragraphs analyse a number of such studies in detail. Drawing on primary quantitative and qualitative data on agricultural production relations in northeast Tanzania, Mueller (2015) found that distinct markets for casual and regular employment exist side by side.[40] The casual labour market is characterised by its high levels of insecurity and irregularity with very low wages – around US$0.85–US$1.70 per day in 2008. In contrast, regular

[39] Section 2.3 draws on several contributions published in *Rural Wage Employment in Developing Countries* edited by Oya and Pontara (2015).

[40] Mueller (2015) is based on fieldwork carried out in 2008, and was first published in 2011 (Mueller, 2011). Nevertheless, this work refers throughout to Mueller (2015), as it contains updated information. Compare, for example, Mueller (2011, p. 33) to Mueller (2015, p. 154).

employment is more secure, more highly remunerated, and mostly located in the rural non-farming economy. Thus, the study highlights that rural labour markets are internally heterogeneous, consisting of "qualitatively and quantitively different segments" (p. 154).

Moreover, Mueller (2015) reported that around 85% of all surveyed individuals pursue casual employment and that almost 60% of the households surveyed had at least one household member working for a wage. This is in strong contrast to the latest national data from Tanzania's 2014 integrated labour force survey (ILFS). The ILFS identified only 26% such households nationally, and a mere 15% in rural areas (URT, 2014a). At the same time, Mueller (2015) found 22% of all adults had been engaged in waged activities in the last 12 months, compared to the ILFS' 14% (URT, 2014a).

Petit and Rizzo's (2015) study of Rwanda and Ethiopia confirmed Mueller's findings. They compared official accounts with regional data which revealed a picture of rural poverty and employment statuses in stark contrast to the orthodox narrative. In Rwanda, the official national statistics reported that only 6%–19% of the population pursue waged activities (Petit & Rizzo, 2015). In contrast, research carried out by Save the Children found that people living in poverty rely on wages for between 50%–70% of their income (Petit & Rizzo, 2015). Qualitative research found that these groups are, in turn, employed by wealthier rural households with land holdings and/or salaried jobs (Petit & Rizzo, 2015).

Evidence on Ethiopia, Senegal, and Mauritania yielded similar discrepancies. According to Ethiopia's National Labour Force Survey (NLFS) only 7.9% of its population pursued waged activities (Petit & Rizzo, 2015). Yet, regional livelihood assessments by Save the Children UK reported that selling crops and livestock only accounted for 25%–35% of the incomes of people living in poverty in north, northeast, and southeast Ethiopia and, consequently, many engaged in waged activities (Petit & Rizzo, 2015). Looking at village level data in Mauritania, Oya (2015) reported that around 35% of households can be classified as predominantly engaging in waged activities. Likewise, his evidence on large- and middle-scale groundnut farmers in Senegal from fieldwork in 1998 and 2006, suggests that around 53%–62% of the labour share stems from waged labour. Thus, villages economies in both Mauritania and Senegal are "heterogeneous, fluid and characterized by the use of hired labour in agriculture and many non-farm activities" (Oya, 2015, p. 37).

The findings on Tanzania, Rwanda, Ethiopia, Senegal, and Mauritania suggest that the more severe the poverty experienced, the likelier it is that a household engages in casualised waged activities.[41] However, access to higher income segments of non-farming activities can be constrained. As highlighted by Petit & Rizzo (2015), households living in poverty earn the lowest-paid off-farm incomes due to their lack of assets and skills, and Erlebach's (2006) research on Rwanda concurs. There, members of very poor households engaged in non-farming activities pursued poorly remunerated activities such as working as porters and domestic helpers. Also, access to higher wages is not only restricted by the socioeconomic situation of individuals, but also by gender. Mueller and Man-Kwun Chan (2015) report waged activities in value chains in the horti- and flori-culture industry to be dominated by females, while coffee, tea, and cocoa production is mostly confined to men. Moreover, as reported by Petit and Rizzo (2015) and Cramer et al. (2008) for Rwanda and Mozambique, respectively, different wages for similar jobs exist. These wage differentials may be due to the weak bargaining power of workers versus employers, rendering the former reliant on the latter's discretion (Oya & Pontara, 2015).

Moreover, wages are affected by labour supply. It is possible that an oversupply of labour relates to a combination of growing rural populations, increasing prices of agricultural inputs rendering smallholder agriculture less lucrative, and deteriorating soil quality (Petit & Rizzo, 2015). As a consequence, more people enter rural labour markets and hence intensify competition (Petit & Rizzo, 2015). These growing rural populations are translating into land pressure and land shortage, leading to an oversupply of low-skilled workers chasing a limited number of employment options (Mueller, 2015; Petit & Rizzo, 2015). For Tanzania, Mueller (2015) contends that, over time, a reversal of relative bargaining power in rural labour markets has occurred. When Sender and Smith (1990) looked at north Tanzania in the early 1990s, they claimed that there was a shortage of labour, leaving employers in a weak bargaining position. Yet, nowadays, casualisation of labour and the oversupply of workers is argued to lead to a weakening of workers' bargaining power, culminating in a reversal of bargaining strength (Mueller, 2015).

[41] In Ethiopia the reliance of people living in poverty on waged labour increased from 2005 to 2015 (Petit & Rizzo, 2015).

Context matters. In contrast to the evidence presented on Ethiopia, agricultural labour markets in northern Senegal tightened between 1998 and 2012, translating into rising real wages for seasonal and casual wage labourers. Oya (2015) argues that these changed labour market conditions are caused by a rural exodus of youth, leading to less local and migrant labour available. Thus, the situation in north Senegal's agricultural labour markets is very different to the situation outlined by Mueller (2015) in those of north Tanzania.

The bargaining power of employers and workers must be analysed in combination with their structural position. At one end of the spectrum, to discipline labour, informal employers can exert indirect control through providing housing, training, education and social benefits (Cumbers et al., 2010). In a situation of a labour surplus, employers can also resort to a 'reservoir' of labourers. Likewise, tying informal workers to their workplace might be important as the "precise amount of effort to be extracted cannot be 'fixed' before the engagement of worker, machinery and products for purposeful … action in the labour process" (C. Smith, 2006, p. 390). At the other end, as individual actions are of no help in an environment of informal labour oversupply and given the non-existence of enforceable labour contracts, workers might be able to organise collectively. However, the success of such action critically depends on the broader context of labour relations (including legislation and its enforcement), type of workplace, the sector in question, and the special unit of work.

Another defining feature of informal rural labour markets is underemployment. Underemployment can be defined as a situation in which labourers work fewer days than they want to (Mueller & Man-Kwun Chan, 2015). Empirical evidence from Cramer et al.'s (2014b) study of small-scale coffee and tea farms in Uganda and Ethiopian small-scale coffee farms highlights that underemployment is common. In Uganda, workers were employed for only 70 and 100 days in coffee and tea farms, respectively, and in Ethiopian coffee farms for only 38 days (Cramer et al., 2014b). Underemployment might equally be of importance in ASM labour markets. As outlined previously, a mining pit's employment intensity depends on the richness of the deposit.

To conclude, small context-based labour market surveys have drawn a picture of active rural labour markets where waged labour is prevalent and yields heterogeneous incomes for workers. Table 2.1 highlights the discussed differences between context-specific and national labour data. Country evidence from Tanzania, Rwanda, Ethiopia, and Mozambique reports a high degree of internal differentiation in

Table 2.1

Contrasting Results of Context-Specific and National Labour Market Data from SSA

Case-study country	Context-specific labour survey	National labour market data
Tanzania	60% of rural households had at least one household member working for a wage (Mueller, 2015)	Entire country: 26% (URT, 2014) Rural areas: 15% (URT, 2014)
Rwanda	Very poor households rely to around 50%–70% on wages (Petit & Rizzo, 2015)	6%–19% of the population pursue waged activities (Petit & Rizzo, 2015)
Ethiopia	For people living in poverty in North, North- and Southeast Ethiopia, only 25%–35% of their income comes from selling crops and livestock (Petit & Rizzo, 2015)	7.9% of the population engages in waged activities (Petit & Rizzo, 2015)

rural labour markets and provides valuable analytical categories for the study of rural labour and poverty. We have further seen that access to distinct layers of rural waged labour is linked to, and constrained by, socioeconomic status and gender. The thesis explores this channel for ASM labour markets. We have also seen that most empirical studies on rural labour markets centre their analysis on farming activities. Even though there are some exceptions (notably Cramer et al., 2008), knowledge about the dynamics of NFRE in SSA is limited. Given the outlined heterogeneity in agricultural labour markets, a disaggregated analysis of ASM's labour markets, looking at specific occupations is called for.

Heeding this call, this thesis analyses employment and power relations in Tanzania's ASGM sector; it aims to unpack distinct manifestations of labour, contending that ASM labour markets are a salient source of social differentiation. Analysing Tanzania's burgeoning ASM sector through the lens of its employment statuses and jobs, and how these are linked to poverty (reduction), yields a promising extension of existing scholarship on rural labour markets and of the ASM literature.

2.4 Tanzania's ASM Labour Markets

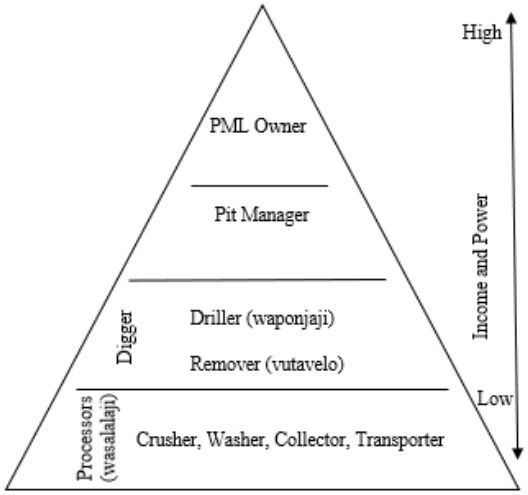
ASM operations in Tanzania (and elsewhere in SSA) are structured along a complex organisational hierarchy. Most operations are three-tier systems consisting of mine workers, pit managers, and primary licence owners (Bryceson et al., 2014; Bryceson & Jønsson, 2010; Jønsson & Fold, 2009; Lange, 2006).[42] The most powerful

[42] Throughout the thesis pit manager and pit owner are applied as synonyms.

actor is the primary mining licence (PML) owner. PML owners are rarely involved in the production process and commonly either lease out their mineral claims to local pit managers or, less frequently, to foreign actors (Bryceson & Jønsson, 2014; Schoneveld et al., 2018). Pit managers are in charge of all the operational tasks needed to turn a mining claim into a productive operation. This includes recruiting workers on a daily basis and buying and servicing the necessary equipment (Bryceson & Geenen, 2016). During times of low returns, pit managers themselves dig. At the lower end of the organisational hierarchy, different groups of mine workers with distinct occupational tasks are found. There are two types of 'diggers'. Drillers (*waponjaji)* deploy simple manual tools such as hammers and chisels to deepen pits, shafts, or tunnels and remove the ore (Bryceson & Geenen, 2016); with work underground, this is a high risk occupation. A second group, the 'removers' (*vutafelo),* is responsible for hoisting the raw material in buckets from the bottom of the pit (Bryceson & Geenen, 2016). *Vutafelo* are mostly young men with limited ASM experience, while *waponjaji* are more veteran miners (Bryceson & Geenen, 2016). Figure 2.1 provides a rough overview. A third group, crushers, is found at processing sites. Crushers, predominantly women, manually work the ore with self-constructed hammers next to the mining pits (Bryceson & Geenen, 2016). In addition, processing workers transport, wash and pan ore, while others fulfil security duties (Bryceson & Geenen, 2016). This group of processing workers including stone crushers, is sometimes referred to as *wasalalaji* (Bryceson & Jønsson, 2010). Like the diggers, they do not own significant inputs other than their

Figure 2.1

Organisational Structure of ASM Operations



*Note***.** Based on D. F. Bryceson (2015); D. F. Bryceson, Fisher, et al. (2014); D. F. Bryceson & Jønsson (2010).

labour power. The next paragraph discusses empirical evidence of how the returns from a pit are distributed. Their common feature is that they do not own any significant inputs apart from their labour power.

The distribution of a pit's revenue is based on production sharing agreements (PSAs) in which the above outlined groups receive differing shares of unprocessed ore instead of cash (Bryceson & Geenen, 2016; Jønsson & Fold, 2009).[43] Shares are generally paid when a production threshold of 50 kg is reached. PSAs differ from place to place. For southwest Tanzania, Jønsson and Fold (2011) found that the PML holder receives 30%, the pit manager 40%, and the diggers 30% of a pit's unprocessed output. Workers being paid in the form of raw rocks or sand means that the quality of the received material affects actual incomes and results with a high degree of uncertainty of value (Bryceson & Geenen, 2016). As the amount of gold in the raw ore cannot be determined at a glance, picking the 'right' bag occurs in the form of bargaining among fellow miners (Jønsson & Fold, 2009).[44] While some scholars contend that sharing ore instead of receiving salaries is more "transparent" and allows miners "to sell their gold to whomever they want" (Jønsson & Fold, 2009, p. 217), others emphasise that it favours the PML owner, as their bargaining power is high and labour contracts are almost non-existent (Kulindwa et al., 2003; Merket, 2019). A further source of conflict arises between the PML holder and the pit manager. The former is suspicious that production may be under-reported, while the latter is convinced that the licence holder, given that they are not present at the site, should receive a much smaller share (Merket, 2019).

Combining quantitative and qualitative evidence, a 2019 report by IPIS looked at the organisation of the mining, processing, and trading of minerals in northwest Tanzania (Merket, 2019).[45] The PSAs found in northwest Tanzania are similar with those found in the southwest of the country (Bryceson & Jønsson, 2010; Jønsson & Bryceson, 2009) but local differences do exist. Research by IPIS found that mining cooperatives were present in 11% of the 447 sampled ASM operations in northwest Tanzania, accruing 10% of a pit's revenues and that in 44% of all surveyed mining pits,

[43] Banchirigah (2008) described the labour process in Ghana, Bryceson and Geenen (2016) and de Brier et al. (2020) in the DRC, and Grätz (2013) in West Africa, specifically in Benin, Burkina Faso, and Mali.
[44] Superstitious beliefs and witchcraft are an important dimension prior to and during these distributional processes (Bryceson et al., 2010).
[45] Overall, the study covered 447 mining sites, 337 of them gold, in four northwestern regions in Tanzania (Merket, 2019).

the land owner received 10% of the raw ore (Merket, 2019). We have seen that there is some degree of established knowledge in form of the 30-40-30 PSA scheme, yet the above highlights that there are location-specific differences.

Thus, PSAs are shaped by the abundance of workers and capital in the area, the availability of skill sets, geography, local and sectoral institutional settings, and prevailing technology (Jønsson & Fold, 2009). Labour abundance might lead to a more competitive ASGM labour market and to a worse bargaining position for miners when negotiating wages vis-à-vis labour contractors. In contrast, an abundance of mining land might increase the incomes of wage-employed miners, as more miners venture into self-employment, rendering labour power scarcer. Lastly, improved technology such as ball mills might cause a fall in demand for waged manual crushing, weakening the bargaining power of workers.

Existing evidence draws a picture of high incomes for ASM diggers. IPIS reported an average monthly income of between US$90 and US$110 for ASGM workers in northwest Tanzania (Merket, 2019). These wage levels are consistent with earlier estimates by Bryceson et al. (2014) of average sectoral incomes of US$99.[46] Relating these figures to average incomes in Tanzania today, the monthly income of ASGM workers is above the country's average monthly per capita income by 11–36% (Merket, 2019) and 22% (Bryceson et al., 2014).[47] A prior study by Jønsson & Bryceson (2009), assessing incomes indirectly through consumption, found even higher average incomes of US$150. In comparison, a study by the Food Agricultural Organization (FAO) reported agricultural monthly incomes in Tanzania of only US$38 (Rapsomanikis, 2015) while a case study on northeast Tanzania reported monthly agricultural wages of around US$17–US$34 (Mueller, 2011). These numbers indicate that ASM incomes are significantly higher than agricultural incomes.[48]

Despite its scantiness, data on ASM processing task workers' incomes, such as crushing, washing and panning of ore, suggest that parts of the ASM labour force are earning much lower incomes than diggers. For northwest Tanzania, Merket (2019)

[46] Note that, even though the average incomes reported by Merket (2019) and Bryceson et al. (2014) denominated in US$ are similar, their nominal values in TZS are not. This is because Tanzania's currency depreciated substantially vis-à-vis the US$ between the time when Bryceson et al. rolled out their fieldwork (2006–2008) and the present. Back then, US$1 was worth TZS1,050 to TZS1,250 (Bryceson & Jønsson, 2010), whereas during Merket's study in the spring of 2019, US$1 was around TZS2,281, a depreciation of roughly 100%.
[47] The average per capita monthly income was US$82.1 in 2019 at 2010 US$ rates (World Bank, 2020a).
[48] Mitullah et al. (2003) found similar results for Western Kenya

reported washing and panning, related to lower observable risk, to yield incomes around 36%–40% lower than the average income of a digger while crushers' wages were 29%–77% lower. With respect to the gendered nature of incomes, Merket (2019) reported that female miners, mostly engaged in crushing and panning ore, earn up to 66% less compared to their male peers. Table 2.2 summarises this income inequality in Tanzania's ASM sector, the methodologies behind these findings, and its limited empirical grounding.

Notwithstanding the marked income variance reported by Merket (2019), to date, research on ASM incomes in Tanzania have mainly focused on diggers' incomes, which are relatively high (Bryceson et al., 2014; Gerig et al., 2020; Jønsson & Bryceson, 2009; Lange, 2006). At the same time, processing activities such as crushing, panning, and washing ore which, as the thesis argues, are equally part of ASM realities, are linked to lower incomes and under-analysed. Excluding these ASM activities at the lower end of the income continuum leads to an incomplete – and thus possibly distorted – image of ASM in Tanzania, and more generally in SSA.

This argument is reinforced by recent data on ASM incomes in South and North Kivu in the DRC by de Brier et al. (2020). Even though their sample includes washers as well as diggers "to keep a representative sample", they exclude stone crushers and other processing workers. For the latter, they reported a monthly median income ranging from US$84.37 to US$115 (pp. 9, 16). Likewise, covering a more heterogenous group of mine workers across different regions in eastern Congo, de Brier et al. (2020) found a lower median income between US$71.37 and US$86. Even though the different minerals being mined might affect the wages paid, the Congolese data reinforce the argument that *different ASM labour tasks* yield distinct incomes and that this ought to be reflected in the analysis in order to obtain a fuller picture. As Merket (2019) is the only source of empirical information on incomes linked to processing tasks, and given that most of the data are indicative (see Table 2.2), further empirical work is vital. Heeding this call, this thesis empirically examines ASM incomes related to distinct tasks and their impact on poverty.

Table 2.2

Incomes in Tanzania's Rural Economy: ASGM Activities and Agriculture

Labour task	Estimated monthly incomes	Methodology
Digging	US$90–110 (Merket, 2019)	"These numbers are rough estimations and mainly indicative. They are the result of a combination of quantitative and qualitative analysis, not of a simple statistical calculation. We asked miners how much they earn in a typical month and triangulated this with other indicators such as production and worker numbers" (H. Merket, personal communication, November 30, 2020)
	US$99 (Bryceson et al., 2014)	108 respondents, 84 diggers, 24 either PML holders or pit managers, all males. According to Bryceson et al. (2014): "Income estimate should be viewed as indicative for the purpose of comparing income differences between the [career entry age of] mining cohorts" (pp. 46, 50).
	US$120 (Lange, 2006)	Personal communication between S. Lange and C. Andrews, a Principal Mining Specialist from the World Bank (Lange, 2006, p. 15).
	US$150 (Jønsson & Bryceson, 2009)	"To avoid asking direct questions about income that the miners would be loath to answer, we queried how long it would take miners to purchase various consumption goods (for example, a motorbike, tin roofing, a compressor) if they were to save based on their current mining incomes. This gave us a means to roughly calculate monthly earnings for comparative purposes" (Jønsson & Bryceson, 2009, p. 259).
Ball Mill Operators[49]	US$132 (Merket, 2019)	See Merket's explanation above.
Crushing	US$54–70 (Merket, 2019)	As above
Washing and Panning	US$20– US$78 (Merket, 2019)[50]	As above
Agricultural Wages	US$38 (Rapsomanikis, 2015)	FAO estimates based on Tanzania's 2009 Health and Development Survey.
	US$17– US$34 (Mueller, 2015)[51]	Surveying five villages in North Tanzania in 2008, Mueller reported a daily wage of US$0.85–1.70 for casual work (*kibarua*).

[49] After the rocks are rushed by workers into smaller pieces, they are loaded into a ball mill where they are ground into smaller bits. The owners of such a ball mill charge between US$0.4–1.3 per 50kg bag of ore (Merket, 2019).

[50] This is a conservative estimate. Daily wages for washing and panning are between US$1.3–2.6 (Merket, 2019). However, Merket (2019) adds that "In times of low productivity there might only be work for a few days per week or a few hours per day" (p. 42). Hence, we assume that respondents worked 15 days a month.

[51] As Mueller only reported daily incomes, the monthly incomes are indicative and were calculated by assuming working 20 days a month. The working days are indicatively based on the previous discussion of the findings of Cramer et al.'s (2014b) on underemployment in waged farming activities.

The work by de Brier et al. (2020) is complemented by recent findings by Geenen et al. (2021) on the earnings of ASM workers in South Kivu in the DRC. They surveyed 469 individual pit workers such as pit managers, supervisors, diggers, and repair workers (site workers such as crushers, transporters, and processors were not sampled). Moreover, all the respondents were men. Nevertheless, the researchers claim that their evidence is based on a representative sample. It should be noted, however, that asking pit managers to provide lists of workers might have led to selection bias in the form of only listing well-disposed respondents. Geenen et al. (2021) found that a high degree of income variation exists among pit workers. They estimated that in a month of production pit managers earned US$764; supervisors US$368; experts US$208; and rock and sand evacuators US$96. Note the marked income differences compared to the Tanzanian ASM income data by Bryceson, Fisher, et al. (2014), Merket (2019), Jønsson & Bryceson (2009), and Lange (2006). For instance the monthly income of around US$204 for "experts" is substantially higher than the income of US$90–150 reported by other research on Tanzanian ASM income (Jønsson & Bryceson, 2009; Merket, 2019).[52] They conclude that the most important determinant of a mine worker's earnings is one's labouring tasks at the pit which, they argue, are linked to merit-based factors such as years of mining experience, and level of education but also non-merit-based aspects such as financial risk. Overall, they conclude that merit- rather than identity-based factors positively affect the upward mobility of miners.

Apart from analysing personal factors shaping the prospect of success in ASM, scholars have also examined the role of context-specific informal networks. Empirical evidence from two mining settlements in southwest Tanzania reveals a complex picture (Bryceson & Jønsson, 2010; Jønsson & Bryceson, 2009). Interviewing 108 miners, Jønsson and Bryceson (2009) found that, on average, miners stay longer at their first job than at subsequent sites. The first site allows miners to learn "how to mine" and to build networks: in effect, it is the site of an informal apprenticeship (Bryceson & Jønsson, 2010, p. 380). An early arrival at mining strike sites and previous experience at other sites are critical factors for success (Jønsson & Bryceson, 2009, pp. 267–268).

[52] Geenen et al. (2021) define *experts* as workers who either are "in charge of building timber constructions to stabilize the pit"; who dig the tunnels, or repair and maintain water and oxygen pumps; or are gold prospectors (p. 4). Moreover, the authors reported incomes by week. To help comparability, we translated them into monthy incomes which falls short of acknowledging income volatility due to underemployment. Thus, the presented numbers are indicative.

Strong social networks are an important source of such information and are a key to upward mobility for those able to embark on a more successful career in the ASGM sector (Jønsson & Bryceson, 2009). These networks function through their personal nature including advice from a relative where gold is mined successfully, teaming up with people from the same ethnic group at a mining site, and receiving informal training (Jønsson & Bryceson, 2009). Yet, context matters. In Ghana, ASM skills are acquired by a different logic (Hilson, 2010). The country has a thousand year old ASM tradition and "local inhabitants had a sound knowledge of gold processing prior to the arrival of the Portuguese" in 1471 (Hilson, 2002b, p. 18). Thus, in Ghana mining skills are "omnipresent", "passed from generation to generation", and many workers who enter the ASM sector have previously worked at large-scale operations (Hilson, 2010, p. 299).

Yet, the data have limitations. The first is that Bryceson and Jønsson's (2010) sample covers male diggers only. Even though they report that "female miners did not appear in great numbers" (p. 383) in either mining settlement, it is estimated that in Tanzania around 20–30% of the ASM workforce is female (UN Women, 2016). Despite this presence of women in ASM, both Bryceson and Jønsson (2010) and Jønsson and Bryceson (2009) remain silent on females' occupational trajectories and only add: "it is likely that women's mobility is markedly different from men's in mining settlements but we have no data to substantiate that hunch" (Jønsson & Bryceson, 2009, p. 258). In the southwest Tanzanian sample, females were mainly engaged in crushing, washing, panning and transporting activities (Bryceson & Jønsson, 2010). As outlined above, these are the types of ASM activities where low wages prevail. Thus, female ASM workers might face different obstacles compared to their male peers.

Last, but not least, Jønsson and Bryceson (2009) themselves acknowledge that the sample is biased towards ASM success as dropouts are not covered. Given the difficulties in capturing unsuccessful ASM workers, information on why miners leave the sector and what they do afterwards is scant. Research by Bryceson and Jønsson (2015, 2010) and Jønsson and Bryceson (2009) reports that most small-scale miners do not continue into old age; the physical demands of the job mean that at a certain point diggers either move on to become pit managers or, depending on their level of success, exit the sector to pursue farming or move to larger cities to diversify their incomes. Moreover, the earlier a miner entered the sector, the longer he stayed at each site. At the same time, little is known about the miners who drop out, as most samples are skewed towards those who succeed in the sector. Interviewing 18 ex-miners in

southwest Tanzania, they found that on average they had mined for 12.5 years at around three different mining sites before shifting towards running small service and trade businesses. Most cited its "unhealthy, hard, and risky work" as their reason for leaving ASM (Bryceson & Jønsson, 2010, p. 389).

Occupational dynamics with respect to temporality and type of engagements in ASM are complex and in response scholars have created different typologies of miners – permanent, seasonal, and poverty-driven. The first group, permanent or "career miners" (Bryceson & Jønsson, 2010, p. 384), spend most of the year in ASM activities, earning significantly higher incomes than they would have in other rural income activities (Weber-Fahr et al., 2001). The second group, seasonal miners, enter and exit the sector inversely to agricultural production. Hence, they prefer farming to ASM during the planting and harvesting seasons (Weber-Fahr et al., 2001). This group of miners is also conceptualised as rush-type miners, "lured by the prospect of earning fast money" (Hilson, 2010, p. 299). The third group, poverty-driven miners, is conceptualised as facing, or having experienced, economic hardship, causing them to engage in ASM. Consequently, they are trapped in a circle of low formal education and low earnings (Weber-Fahr et al., 2001). However, it should be noted that these categories strongly overlap. For instance, decisions to engage seasonally or permanently in ASM might be poverty-driven and/or driven by the income diversification rationale of a seasonal miner.

Having outlined the varieties of ways in which ASM workers engage in these activities, there is ongoing discussion regarding to what degree their actions are self-determined or limited by structure. On the one hand, scholars have described ASM as a sector with low entry barriers and whose worker share a collective occupational identity (Bryceson, 2015; Bryceson & Geenen, 2016). As part of this narrative, miners are characterised as "self-directed agents" who find themselves in "work relations on a trial and error basis" embedded in a "weak bureaucratic state" (Bryceson & Geenen, 2016, pp. 299–300). Even though these scholars do not want to "romanticise" ASM, they contend that "class and educational advantages are not a barrier to work entry or decisive for economic success" for artisanal miners today (Bryceson & Geenen, 2016, pp. 301, 309). Thus, ASM today is conceptualised as being transformative, parallel to frontier mining in the 19th century in the US (Bryceson & Geenen, 2016). This camp argues that smallholder agency can overcome structural impediments such as

information asymmetry, low skill levels, and limited access to finance, to name but a few.

On the other hand, a second camp contends that marked structural barriers exist in ASM. Becoming a pit owner or a PML holder is difficult, as it requires work experience, knowledge of the industry, access to capital, and contacts (Fisher et al., 2009), and research has shown that access to a formal mining claim and capital is linked to an individual's power and knowledge (Fisher, 2007; Fisher et al., 2009). Again, this thesis emphasises that focusing only on the group of diggers earning above-average ASM incomes disregards the asymmetries across waged and self-employed workers in the sector. Here, the concept of self-directed agency might be misleading. Drawing an analogy with the misconception of the "African smallholding farmer as the 'representative' agent" (Mueller, 2015, p. 206), it can be argued that a "small is beautiful" (Geenen & B. Verbrugge, 2020, p. 82) narrative of ASM neither helps to analyse ASM's internal heterogeneity nor to understand its structural barriers.

Instead, this research adopts a political economy approach to the study of ASM labour markets, by examining how the type of job, employment statuses, and site-specific power relations have fed into poverty outcomes. Most studies barely discuss ASM labour market fragmentation. With B. Verbrugge (2016, p. 109), this research is premised on the idea that to understand distributional outcomes such as poverty, it is necessary to examine how labour relations are structured, controlled, and how revenues are distributed. The final part of this chapter links key evidence on rural labour markets to the findings of the previous chapter on ASM's impact on poverty in Tanzania. In so doing, the next section highlights the research gap and question that this work seeks to address.

2.5 Outlining the Research Gap

This chapter has discussed scholarly knowledge of ASM labour markets with a focus on Tanzania. Primary data on Tanzania's ASM sector convey a picture of high sectoral wages (Bryceson et al., 2014; Jønsson & Bryceson, 2009; Merket, 2019) – but this is the result of most publications concentrating on reporting and discussing average incomes of diggers only. In doing so, they frame ASM as a sector in which incomes are significantly higher than those in other rural livelihood activities. Discussing indicative data on ASM incomes earned through ASM processing tasks, the chapter has reported

heterogeneous incomes and that diggers, almost exclusively men, constitute the upper end of the ASM income distribution. At the same time, crushing, washing, and panning of ore yield much lower incomes. By excluding these latter groups, an incorrect picture of the sector and its transformative potential on individuals will have been drawn.

Chapter 1 highlighted that there is mixed but scant empirical evidence on the poverty-reducing ability of ASM in Tanzania (Fisher et al., 2009; Mwaipopo et al., 2004). Thus, no conclusive relationship has been established to date. Contributions drawing a poverty-reducing picture of ASM in Tanzania tend to conceptualise miners as self-directed agents, shaping their work relations on a trial and error basis (Bryceson & Geenen, 2016). This understanding echoes de Soto's view of informality as a setting in which self-employed and self-directed agents can exert employment choices to a strong degree (de Soto, 1989, 2000; K. T. Hansen & Vaa, 2004).[53] Similar to the orthodox narrative in rural labour markets, most ASM literature portrays the sector as consisting of self-employed diggers, yet we have seen that in other parts of the rural economy waged employment is much more common and complex than official data suggest. This contrasting narrative highlights the heterogeneity of employment relations, wage levels, and thus differences in bargaining power. Even though empirical knowledge regarding the organisational structure of ASM has been established (Bryceson & Jønsson, 2010), knowledge concerning ASM employment relations – the spectrum of waged to self-employed activities – is thin.

Also, many miners – given that they do not hold any capital and thus are selling only their labour power – might effectively be disguised wage labourers. For them, structural constraints such as information asymmetry, bargaining power, and fallback positions might be different to those experienced by self-employed individuals. Yet, self-employed miners might equally have to bargain and be affected by their fallback position. The chapter outlined that rural waged activities are more prevalent than official data suggests: the same may be true in ASM labour markets.

We also know little about how distinct positions in ASM labour markets affect outcomes differently in terms of wealth creation and poverty reduction. Different authors (Bryceson & Jønsson, 2010; Fisher et al., 2009; B. Verbrugge, 2015) have shown that informal ASGM labour markets are structured, entailing distinct wage levels, working conditions and hours linked to a worker's relative social and economic position,

[53] The thesis engages with this view on economic informality in more detail in Section 4.1.

affecting individuals' relative bargaining power. At the same time, this indicates that it is not only an agent's skills and capacities that determine wages, but also demand side features of labour markets such as the marked bargaining power of ASM financiers in an undercapitalised sector (Leontaridi, 1998).

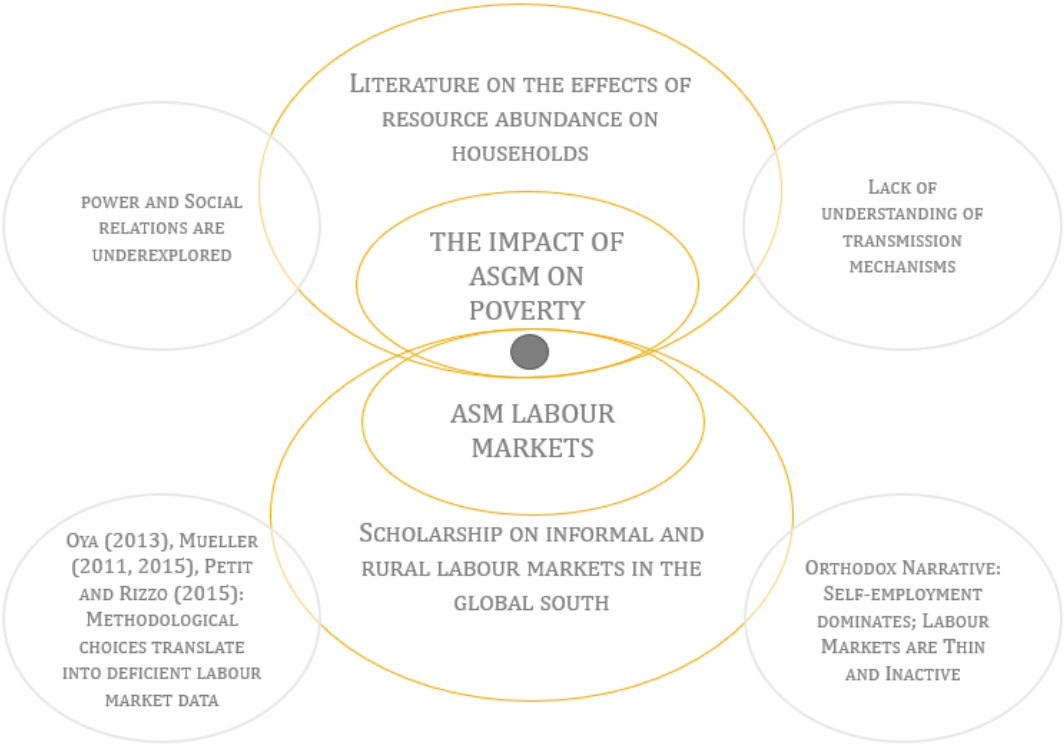
A salient concern of this thesis is to analyse ASGM through the lens of its labour markets, as attention to labour markets and their functioning is essential to the analysis of poverty. As argued by Oya and Pontara (2015), orthodox scholarship on labour differentiation and structure "has been divorced" (p. 5) from the analysis of poverty over time. With Mueller (2015) and Mueller and Man-Kwun Chan (2015), it hypothesises that understanding the internal logics of rural labour markets constitutes the "missing link" in the discourse on labour and rural poverty. The thesis seeks to extend this analytical lens to ASGM. Linking my findings (i) on the micro-level literature on the interplay of ASM and poverty to (ii) the review of rural labour markets, the following questions arise: How do income patterns differ across ASM tasks? What type of employment statuses exist in context-specific rural ASM labour markets and how do they affect income levels? How does ASM translate into social differentiation?

Figure 2.2 visualises the branches of scholarship discussed in this and the previous chapter. The grey dot represents the research gap that the thesis seeks to address. By linking the study of the effects of ASGM on households to an analysis of employment relations in the sector, a methodological contribution to the ASM literature and to the empirical scholarship on rural labour markets in developing countries is made. As discussed, in Section 2.3, this link has been established in case studies on farming Yet, to date, it has been underexplored in the case of ASM, today's most important off-farm income activity in SSA (World Bank, 2019).

In the tradition of heterodox research on rural labour markets, this thesis utilises both primary quantitative and qualitative data. It analyses the sector's ability to reduce poverty through its labour markets by considering agency and power structures. It links this to sectoral and domestic politics. All of the above aspects have been under-researched and/or non-integrated by scholars, whereas they lie at the heart of this contribution. The following chapter introduces the thesis's research questions and discusses its research design

Figure 2.2

Intersecting Areas of Scholarship Relevant to This Thesis and the Resulting Research Gap



3 Methodology: Mixed Methods and Interdisciplinarity

The chapter introduces the thesis's research design and discusses the mixed methods framework that it adopts. It begins by introducing the research question and hypotheses arising. A discussion on the commensurability of distinct research methods follows. This is crucial, as choosing a research methodology is inherently linked to the ontological and epistemological positions of how we see and understand the world and thus needs to be made explicit.[54] Subsequently, the chapter introduces the thesis's research design. To this end, it discusses the quantitative method: a household survey, as well as the qualitative methodology applied, semi-structured interviews. Finally, it introduces the research sites and the reasons for choosing them.

3.1 Research Question(s) and Hypotheses

Chapters 1 and 2 discussed scholarship on the impact of resource abundance generally, and more specifically its impact at the household level, on Tanzania's ASGM sector, and on informal, rural labour markets. This work detected two main gaps. First, most orthodox economists have paid insufficient attention to the role of politics in shaping the outcomes of resource abundance.[55] For this reason, this research engages in a disaggregated analysis at the sub-national level – integrating politics and context-specific aspects such as the local political economy and history – and thus taking into account the complex local impacts of resource abundance on livelihoods. The country-level literature addressing artisanal and small-scale mining operations has insufficiently investigated processes of accumulation within the sector over time, namely who profited and to what degree.

Second, the structure and political economy of ASM labour markets – which I contend is the missing link in analysing welfare outcomes of resource abundance – are insufficiently integrated by scholarship to date. Along the line of Mueller (2015), this work claims that the integration of rural labour markets into the analysis is pivotal to hone our understanding of how the distribution of ASM income streams translates into

[54] Section 3.2 draws on Sara Stevano's (2014) discussion of research methodologies.
[55] See, for example, Ross (1999) and Rosser (2006) for an analysis from a political science perspective.

internal differentiation. Examining these transmission mechanisms is vital to understanding the micro-dynamics behind growth and accumulation processes in Tanzania's ASGM sector. More specifically, although hierarchical employment structures in ASGM labour markets in Tanzania – characterised by heterogeneous labour regimes with distinct implications for economic agency – have been acknowledged in the past (Fisher, 2007; Fisher et al., 2009), the nexus between ASM labour markets and its welfare outcomes is underexplored and the relations of production of the actors engaged (i.e. whether workers are waged or self-employed) has not received adequate attention. Yet, as previously outlined, getting the picture right is crucial for crafting meaningful policy interventions. Addressing these three gaps and drawing on Bernstein (2010b) and research in his tradition (e.g., Rizzo, 2011), the following main research question was developed: To what extent and how has Tanzania's artisanal and small-scale gold mining sector reduced poverty for rural households and what role do labour markets play in this?

This main research question is operationalised through Questions 1–3 while Question 4 addresses the political economy of the sector and its labour markets:

1. Who gets what? – To unpack how households in both case study areas are faring and to what degree they find themselves in deprived circumstances.
2. Who owns what? – To understand social differentiation caused by varying property regimes.
3. Who does what? – To analyse how labour processes are organised and how social division among labour tasks emerges.
4. How has the balance of power between contending social groups and/or classes in ASGM altered over time? Who has profited from changing distributional patterns and how did the domestic power structure change? What is the role of politicians and elites in shaping the mode of accumulation in the sector?

The main hypothesis of my research is that Tanzania's growing ASGM sector has not translated into sustainable poverty reduction for many ASGM workers, as they are constricted by local exploitative power dynamics – translating into continuously low incomes – manifested by perverse sectoral labour structures. This research argues that understanding internal differentiation in ASM labour markets across different types of employment statuses, such as casual and self-employed workers, and distinct types

of ASM labour tasks – and labour's internal differentiation – constitutes the missing link in analyses seeking distinct outcomes for different actors. Engaging with the previously outlined branches of literature, Table 3.1 summarises the working sub-hypotheses (H1–H5):

Table 3.1

Sub-Hypotheses

ASM – Poverty	H1: ASM ought to be analysed in the context of a *variety* of livelihood activities to understand its relative importance for incomes and its effects on poverty (e.g., Barrett et al., 2001; Bryceson & Jønsson, 2010; Pokorny et al., 2019). ASGM might allow households to 'insure' themselves to some degree against multiple, often related shocks (e.g., Fisher et al., 2009; Mwaipopo et al., 2004).
	H2: The implications of ASM for poverty and vulnerability are *spatially distinct*, as location shapes the ways in which households are affected by shocks (e.g., Fisher et al., 2009; Hilson, 2010; Hilson et al., 2013; Jønsson & Bryceson, 2009; Merket, 2019; Mwaipopo et al., 2004).
ASM – Labour markets	H3: The degree of waged labour in ASM is underestimated, given the high levels that have been reported for other rural (e.g., Mueller, 2015; Oya, 2010) and urban (e.g., Rizzo, 2011) income activities.
	H4: Wages in ASM are reported to be higher than in agriculture but often incomes apart from digging are under-explored. A rare exception is Merket (2019). This research hypothesises that ASM average incomes are overestimated due to the exclusion of the lowest paid ASM jobs.
ASM – Labour – Poverty	H5: The ways in which ASM leads to *poverty traps* is location specific. ASGM as a sector is dominated by casual labour and undercapitalisation (e.g., Adato et al., 2006; Hilson, 2012; Noetstaller, 1987). This is also because miners find it difficult to accumulate savings, as most of their income is spent covering daily needs (e.g., Adu et al., 2016; Werthmann, 2003).

These hypotheses are addressed at different stages in the thesis. Chapter 5 scrutinises the political economy of mining in Tanzania, setting the scene for Chapter 6, which provides an overview of socio-economic conditions at both case study sites. Chapter 7 explores the link between poverty and ASM by analysing qualitative and quantitative data, while Chapter 8 examines the nature of ASM labour and links it to the analysis of poverty.

3.2 The Commensurability of Distinct Research Methods

The choice of research methods is inevitably linked to the nature and scope of the research question developed (Tashakkori & Creswell, 2007). To reiterate, this thesis

enquires ‘to what extent and how Tanzania’s artisanal and small-scale gold mining sector has reduced poverty for rural households and what role labour markets play in this’. The research question’s first part – *to what extent* – renders a quantitative analysis necessary in order to evaluate the material status quo, whereas its second dimension – *how* – requires qualitative research to examine underlying mechanisms. For this reason, the thesis combines quantitative and qualitative methods by deploying a mixed methods research design. The thesis argues that combining qualitative and quantitative evidence leads to insight which cannot be gleaned through deploying a single method. The next paragraphs discuss the reasons for adopting this particular research design.

Nowadays, orthodox economics is characterised by a strong research paradigm which takes pride in the discipline’s quantitative rigour. It can be characterised by a marked focus on deductive reasoning with one on mathematical formalisation of theory and the transferability of model building (Downward & Mearman, 2006; Fine & Milonakis, 2009; Lawson, 1997, 2006).[56] Despite the fact that social sciences always ought to spell out the assumptions behind the theoretical concepts that they assess empirically, orthodox scholars rarely partake in epistemological discussions or explicitly outline the philosophical positions behind their adopted research methodologies (Stevano, 2014). Economics research paradigm has also been imposed on, and/or adapted by, other social sciences: a development which Fine (2002) describes as “economics imperialism” (p. 2059). According to Fourcade et al. (2015), this understanding of economics as superior to other social sciences is based on the application of mathematical formalisation, a strong hierarchy within the discipline, high demand from powerful actors such as international financial institutions (IFIs), and a higher remuneration compared to other social scientists.

In particular, from the 1990s onwards development economics experienced a transformation away from studies examining structure and context towards quants-only approaches. This development is also visible in scholarship on the resource curse. As analysed in Section 1.2, from the late 1990s, such field became more and more oriented towards analysing large cross-country datasets and micro-econometric assessments at the expense of an analysis of structural aspects relevant to understand transmission mechanisms. Likewise, quants-only micro-studies in development economics, such as,

[56] The strong belief in the superiority of econometrics and mathematical modelling equally prevails among orthodox *and* heterodox doctoral programmes in economics (Lee & Cronin, 2016).

for example, experimental research, claim to be objective and rigorous but remain silent on the analysis of power asymmetries, of wider social structures and how these might constrain individuals (Chernomas & Hudson, 2019; Kvangraven, 2020). Moreover, they are silent how structural macro processes lead up to a situation where a policy intervention is deemed necessary (Stevano, 2020).

Acknowledging the omissions of such quants-only approaches in development research, this thesis departs from this methodological monism by integrating quantitative and qualitative research methods as well as a political economy framework. Quantitative and qualitative research traditions are based on different sets of ontological, epistemological, and methodological positions. As these sets of beliefs sometimes contradict each other, some scholars question the commensurability of quantitative and qualitative research. The thesis takes these critical remarks seriously. Thus, the next paragraphs analyse if and how different research methods, and thus research paradigms, are reconcilable with each other.

A first camp of purists argues that qualitative and quantitative research is incompatible, as both entail contrasting ontological and epistemological underpinnings (e.g., Bryman, 1984, 2012; Maxwell & Mittapalli, 2010).[57] This critique of the 'incommensurability' of distinct research methods is either based on the embedded methods critique or on the paradigm argument (Bryman, 2012; Guba & Lincoln, 1994). The former argues that ontological positions – how we see and understand the natural world – translate into different understandings of the nature of scientific research objects and the knowledge we can obtain from these (Guba & Lincoln, 1989). The paradigm argument conceptualises research methods as a part of a larger research methodology in a specific research paradigm. Purists opine that these research paradigms are competing with each other and are thus irreconcilable (Kuhn, 1970).

A second school has adopted a pragmatist orientation (Creswell & Plano Clark, 2018; Tashakkori & Teddlie, 2010). Pragmatist MMR researchers deploy different philosophical positions at different stages of the research process. They argue that research methods can be combined "on the basis of their practical utility" and that "research methods are not intrinsically linked to specific philosophical positions" (Maxwell & Mittapalli, 2010, p. 146). They believe in "causal relationships but that

[57] The paradigm wars (Gage, 1989) and the paradigm debate among mixed methods scholars (Creswell & Plano Clark, 2018) exemplify this divide.

these relationships are transitory and hard to identify" and choose the subject of their studies based on personal values and analyse this subject "in a way that is congruent with their value system" (Teddlie & Tashakkori, 2009, pp. 84, 86). To conclude, pragmatists assume that the added value of adopting different methods outweighs the problems that come with contradictory ontological underpinnings of qualitative and quantitative research.

Yet, pragmatists are criticised as understating the "actual *influence* of philosophical assumptions on research methods" (Maxwell & Mittapalli, 2010, p. 146). Underexploring such influence might also result in underexploring the ways in which the ontological and philosophical views that a researcher deploys are a function of their training. A researcher's scientific socialisation implicitly shapes the ways in which they design MMR. This can be exemplified by the most common pragmatist MMR design, which first deploys quantitative research and subsequently conducts qualitative research (Johnson & Gray, 2010). Quantitative research promotes "a variable-oriented approach to research, an emphasis on replicability and general laws, and a validity strategy based on experimental or statistical controls" (Maxwell & Mittapalli, 2010, p. 147). Researchers trained in a discipline with a strong quantitative research paradigm, such as mainstream economics, might "inherently" degrade qualitative research methods to being inferior, as they are unable to fulfil their expectations of worthwhile evidence (Maxwell & Mittapalli, 2010, p. 147). Likewise, researchers trained in a discipline with a strong constructivist paradigm might disregard quantitative methods (Maxwell & Mittapalli, 2010).

A third camp of scholars promotes critical realism (CR) as a joint philosophical base for MMR, arguing that researchers ought to explicitly discuss the philosophical underpinnings of research methods. Critical realists perceive reality as structured, open, and differentiated (Lawson, 1997). According to Maxwell and Mittapalli (2010), critical realist ontology can be described as the understanding that "there is a real world that exists independently of our perceptions, theories, and constructions" (p. 145). As a consequence of their critique of pragmatist research designs, critical realists emphasise the need to explicitly discuss how research links qualitative and quantitative methodologies (Maxwell & Mittapalli, 2010).

Having analysed these distinct approaches towards MMR, the thesis rejects the purist understanding of mixed methods as incommensurable and instead acknowledges that qualitative and quantitative research can complement each other. At the same time,

it acknowledges the realist critique that linking and integrating distinct research methods must be discussed explicitly. This is important as quantitative and qualitative research methods' modes of enquiry are based on different philosophical positions. By explicitly engaging not only with the ontological foundations but also the advantages and deficiencies of both methods of enquiry, this thesis sees MMR as beneficial to examine complex social phenomena.

3.3 Research Design

Having discussed the different philosophical underpinnings of MMR, the next sections spell out the MMR design and research methods adopted by this thesis. The research follows an 'explanatory sequential MMR' design where both methods are applied sequentially. As conceptualised by Creswell & Plano Clark (2018), an explanatory MMR design begins by collecting and analysing quantitative data in a timeframe and location. Subsequently, to answer questions concerning the understanding of mechanisms and processes – which cannot be answered by quantitative methods – qualitative data are analysed. In so doing, qualitative analysis aims to substantiate and/or probe my quantitative findings. By juxtaposing both methods, we can triangulate evidence and discuss discordant findings. Having outlined the adopted MMR design, the next section presents the quantitative and qualitative research methods deployed.

3.3.1 Quantitative Research: Designing a Context-Specific Household Survey With Special Reference to Labour Relations

Chapter 2 outlined why large-scale labour surveys are not helpful when analysing the impact of complex and fragmented realities of labour relations in rural parts of developing countries. The variety of employment relations – namely the degree of waged labour and its diverse manifestations – is under-analysed to date. Yet, rural labour markets are an important source of stratification in rural areas and labour markets might be equally relevant to the analysis of ASM's impact on poverty.

Given the above, this research conducted a context-specific household survey to link socioeconomic and ASM labour data at the household level. The survey covers 160 mining and non-mining households, based on a random sample. Its size and scope aligns with other case studies on the structure and dynamics of rural labour markets in

developing countries (e.g., Mueller, 2015).[58] The sample reflects 2%–3% of the population, allowing an explorative analysis linking poverty and labour data to uncover tendencies and correlations but, given its limited size, it is not possible to derive statistically significant results. The following paragraphs outline the design of the survey.[59]

The questionnaire consists of a household budget survey with an integrated labour module. This includes sections on: (a) identification variables, (b) household background, (c) the household roster with questions concerning the employment status of household members, (d) housing characteristics, (e) household resources and assets, (g) food calendar and coping strategies, (h) vulnerability and shocks, (i) household income, and (j) household expenditures. Other sections of the questionnaire focused on ASGM: (f) tasks related to mining, (k) specific questions related to ASGM employment, (l) changes with focus on ASGM, (m) support related to ASGM, and (n) further questions.[60]

Guidance on designing small context-specific household surveys is limited, as most writings on survey research methodology focus on large-scale surveys which seek to answer general purpose policy questions (Stevano, 2014). My survey incorporates questions from previous surveys, as earlier applications in the field constitute an important source of testing and validation (Grosh & Glewwe, 2000; Hyman et al., 2006). Sections a–h and i, in particular, were either adapted from Mwaipopo et al. (2004) or derived from standard literature on large-scale household surveys (UNSD, 2005). At the same time, to combine the household survey with detailed labour market questions on Tanzania's ASGM sector, I adapted section c and added sections j, k, and l.

The design of the labour module of the survey was shaped by a number of methodological choices. First, there is the problematic notion of the 'primary job' within employment modules of many large-scale household and labour force surveys in developing economies (Oya, 2013). This implies that respondents are asked for their *main* economic activity *only* over a specific reference period (e.g., 30 days). Asking

[58] As outlined by Mueller (2015), the scope of the research question in hand affects the sampling methodology. Generally, it might be worthwhile to look at the extremes of the wealth distribution. However, given the thesis's objective – to capture internal differentiation across two rural ASGM labour markets, linking this to the question of poverty – I decided to obtain a population sample, aiming to map different income strata and livelihood activities.
[59] Section 6.1 takes this further and addresses specific methodological choices made during the survey's pilot and implementation phase.
[60] See Appendix B for the full questionnaire in English and Swahili.

only about the primary job jeopardises a thorough understanding of the full scope of *all* livelihood activities and strategies pursued by rural households. This is problematic, as mapping all household activities is essential to understand the *relative* importance of each activity over time, and because many studies have shown that rural households in developing economies engage in a variety of income-generating activities to overcome income volatility (e.g., Barrett et al., 2001; Ellis, 1998). Rural populations diversify their incomes to diminish the risk of an exogenous shock. For instance, in times of bad harvests, one might be able to intensify other income generating activities (such as petty trading) to flatten out the exogenous shock. In essence, this complex reality is not mirrored by most labour surveys and remains under-explored by focusing on the main economic activity only.

Second, getting the terminologies right, when referring to different types of employment statuses and labour regimes, is a challenging but equally important task. Consistent with empirical works on labour relations in rural labour markets in SSA (e.g., Mueller & Man-Kwun Chan, 2015), this research defined waged labour through the *ownership* and/or the *control of the means of production*. To avoid analytical ambiguity, workers are classified as waged if they neither *own* or *control* the land, capital, tools, and other inputs necessary for their labour tasks, and if they are working for somebody else. Here, probing questions are vital to contrast waged and self-employed activities and fully capture the complexity of the underlying labour regime (Oya, 2013).

Third, this research applied a longer reference period than standard labour surveys, asking information about the 12 months prior to the survey for labour-related questions. This choice was made to account for seasonal patterns of employment such as high levels of ASGM during the dry season, possibly low levels during the rainy reason, and thus to detect the occupational changes in the informal economy. This annual time reference is much longer than the 30 days deployed by Mwaipopo et al. (2004). Applying a longer reference period is common practice in specialised labour market surveys and case studies (Mueller & Man-Kwun Chan, 2015).

In terms of putting these remarks to work, in the first days of piloting the survey, great attention was paid to the wording and operationalisation of questions on self- and waged employment. We developed probing questions on how labour processes were structured (e.g., in case respondents worked for somebody else but also dig on their own), enquired about ownership and control over different means of production (e.g., if the respondent works on their own land and who supplies different inputs), and about

the distribution of revenues. All these measures were essential to contrast the concepts of waged labour and self-employment in a meaningful way during the interviews. Carving out the true nature of labour relations is anything but a simple task as "what at first sight seems like self-employment and which also presents itself as such, often conceals sundry forms of wage labour" (Breman, 1996, p. 8). Therefore, the utmost caution was exercised during our interviews.

Fourth, as mistranslating key concepts might lead to significant bias in household surveys (Rizzo et al., 2015), the survey set a particular focus on translating context-specific concepts of work from English to Swahili. The survey avoided culturally sensitive and emotionally loaded terms such as *kibarua*, which bears a negative connotation and notion of stigmatisation (see Section 2.2). Instead, Aloyce, my research assistant, and I inquired if a person was working for somebody in order to detect informal waged activities. A second term, ajira (employment), was problematic, as it refers to employment in general, but also, more narrowly, to formal employment and so using it might lead to an underestimation of informal waged employment (Rizzo et al., 2015). Translating the labour module, these important details were considered. The respective wording for contrasting both concepts was the following:

> Please name all waged activities/self-employed activities which you and/or any other member of the household has pursued during the last 12 months?
>
> Tafadhali taja shughuri/kazi ajira ambazo wewe/au mwanakaya mwingine wa kaya hii amewahi kufanya katika kipindi cha miezi 12 iliyopita?

Having discussed how this research addressed methodological choices to minimise possible sampling errors throughout the development of the questionnaire, the analysis now focuses on another potential source of weak empirical data, unintentional bias (Sumner & Tribe, 2008). Unintentional bias is typically introduced by the researcher and is closely linked to issues of power and positionality.

Positionality can be summarised as how the researcher – driven by their cultural, political, and material background – shapes the research process, generates, and analyses data. This requires special attention when a researcher from a socioeconomically advantaged background conducts fieldwork in an environment of economic hardship in the Global South. This imbalance is emphasised by Adams and Megaw (1997):

> We come from outside the village. We speak other languages and follow arcane practices … and we seem to have powerful friends because we bring letters of

> introduction, at least from the next tier of government up. Above all, we can come and go: we are not committed (p. 219).[61]

Reflecting on these socioeconomic asymmetries as well as context-specific cultural dynamics is essential when conducting research on vulnerable groups living in poverty in an environment of informality. The researcher, with an urban, materially privileged and powerful background, interacts with people who are at the other extreme of the continuum with regard to wealth, power and formal education. These asymmetries ought to be reflected upon during the research process, as a researcher's values and convictions – i.e., their personal and scholarly socialisation – affect ontological considerations such as the choice of methods. This research is no exception.

To address these important points, this research aimed to reflect on how, I, as an outsider, relate personally to, as well as how I am perceived externally by, the individuals studied (Desai & Potter, 2006). One example would be that respondents might be intimidated by the asymmetry of wealth and power, facing a well-versed local research assistant and an economically privileged foreign researcher in an interview about their living conditions, which might be very different to ours. Thus, we aimed to countercheck our roles as researchers continuously. This included ensuring as far as possible that respondents felt at ease and perceived the interview as a safe space in which they could communicate what they felt to be most pressing. For instance, at the end of each interview we asked if there was anything else they would like to add and throughout our stay behaved as open-minded and humbly as possible.

Having discussed how the role of the researcher might introduce bias, the discussion continues to review the possible biases arising during the survey process. This concerns the *reliability* of the instruments and measures adopted (Fowler, 2014). According to Bulmer and Warwick (1993) this is the "extent to which a research instrument gives a consistent or reproducible result" (p. 157). This raises the question of whether the instruments applied are consistent across different observations. In my survey, this was ensured as far as possible by asking all respondents the same questions while trying to ensure the same meaning for everyone (Fowler, 2014).

Despite checking the reliability of the instruments adopted, the sample might be biased as miners may take the same action but for two different reasons: first, because

[61] With respect to "arcane practices", most village chairpersons quickly grasped the concept of stratified random sampling – perhaps because of similar demands by previous research – but wondered why we would consider it useful to select households randomly.

mining households who have exited ASM and subsequently left the village were not captured (Jønsson & Bryceson, 2009); and, second, as mining settlements are characterised by high migration rates, the few 'winners' of the ASM 'lottery' might have moved to a bigger town or city. Both, combined with the tendency that vulnerable households are more likely to enter the ASGM sector, could inflict bias as it appears that a high fraction of non-successful mining households tend to remain in the village. Consequently, my sample might be biased towards failure. Thus, it might underestimate the poverty-reducing ability of the sector given that individuals who struck gold and consequently left the case study area are not captured by the data. Chapter 7 examines such possible bias in detail.

The timing of the survey might be another source of bias. Chambers (1983) describes researcher's systematic under-exploration of the wet season realities of individuals living in rural poverty as "dry season bias" (p. 20). During this "unseen season" (p. 20), hardship, driven by factors such as high food prices and food shortages – resulting in the sale of assets – might hit hard people living in rural poverty. This systematic neglect is mainly driven by the inaccessibility of remote areas during the wet season (Chambers, 1983) and, in a more context-specific way, perhaps also by the established 'knowledge' that ASGM activities are particularly prevalent during dry season, as production is high and marked levels of ASGM activities prevail.[62]

To account for possible seasonality, this research applied a twofold strategy. The survey was conducted during the dry season, which might have led to overrepresenting mining activities. Yet, as Table 3.2 highlights, ASGM activities

Table 3.2

ASGM Activities Throughout the Year

Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
%	72.2	76.3	72.7	75.3	76.3	78.3	78.8	76.8	72.2	71.2	70.2	68.7

Note. Source: Own data. n=198. Reference period: March 2018–March 2019. Includes all respondents pursuing ASGM activities during reference period.

[62] Merket (2019), for instance, reports that during the dry season the total number of mine workers at mining sites in northwest Tanzania is 31% higher than in the rainy season. This is complemented by Mwaipopo et al. (2004) who found that full-time engagement in mining activities peaks during the dry season from June to October and slumps with the onset of the first, small rainy season towards the end of the year.

remained more or less constant throughout the entire year prior to the survey, although they declined slightly during the rainy season from October to March and peaked slightly during the dry season from April to August. Thus, a seasonality bias could not be confirmed. To triangulate this, in addition, qualitive interviews took place during the short rainy season, in which production was found by other studies to be lower (Merket, 2019). Pursuing fieldwork during both seasons allowed to keep any seasonal bias in check and to capture the interplay of ASGM activities and rural poverty in a more robust way. The household survey informed, and provided the base for, my qualitative analysis, which is discussed next.

3.3.2 Qualitative Research: Semi-Structured Interviews

The survey results informed and developed the focus of my qualitative research. Qualitative research allows the unpacking of mechanisms and processes to analyse the black box behind quantitative evidence (Creswell & Plano Clark, 2018; Sender et al., 2006). Combining both methods allows the researcher to "overcome the speechlessness between both traditions" (Kelle, 2015, p. 603) by acknowledging the value of deploying different methods at distinct stages of the research process (Caracelli & Greene, 1997). With respect to selecting interviewees, this research pursued a two-fold strategy. First, I revisited and interviewed mining respondents in Nyarugusu and Mgusu who had already been sampled in my household survey. Second, I contacted and interviewed different stakeholders in Tanzania's ASM sector. For the first group, questions centred around employment and poverty dynamics in the sector, whereas interviews with the second were centred around the political economy of the sector.[63]

Interviewing ASGM workers took place as follows. GPS coordinates were used to revisit 24 ASGM households that I had previously surveyed to interview a household member engaged in ASGM work. Contacting them was difficult as workers, particularly diggers, left in the early morning hours and returned late, or sometimes commuted to other parts of the ward, of the region, or even of the country. The latter is consistent with previous findings that Tanzania's mining communities are characterised by a degree of inwards and outwards migration (Jønsson & Bryceson, 2017). As well as ASGM workers, 15 sectoral stakeholders were interviewed from the local government council, local village development committee, village chairpersons, an

[63] See Appendix C for the different interview guidelines.

ASM researcher, the Ministry of Minerals (MEM), the Mining Commission, a Regional Mining Commissioner, STAMICO, the Lawyers Environmental Action Team (LEAT), Haki Madini (Tanzanian NGO, specialised on ASM), MTL Consulting, the Geita Regional Miners Association (GEREMA), the Tanzanian Women Miners Association (TAWOMA), and the Foundation for ASM Development (FADev). The aim was to cover a range of interests and voices at the local and the central government level, and beyond the government. Most interviewees were found through snowballing and all interviews took place in November 2019, at the beginning of the rainy season.[64]

This rich qualitative evidence, consisting of roughly 300 transcribed A4 pages, required a rigorous and systematic analysis. A thorough search for qualitative methodologies in the economics literature did not yield satisfactory results. Qualitative and/or mixed methods studies on ASM, poverty or labour market research lacked a systematic way of analysing such data. Therefore, I turned to the field of organisation studies, where the contribution by Gioia et al. (2013) provided an entry point. While I roughly followed the principles of data processing proposed by these scholars, I moved towards a more abductive approach as previously taken by others (Sætre & Van de Ven, 2021; Van Maanen et al., 2007). Abduction can be understood as an iterative approach of moving back and forth between the literature and the interview, combining both inductive and deductive elements (Van Maanen et al., 2007).

The main takeaway from Gioia et al.'s (2013) research was practical advice on how to interpret raw qualitative data and thus to facilitate abstraction. They distinguish between two analytical levels. During the first order analysis, the researcher aims to take up the interviewee's perspective, treating the respondent as a knowledgeable agent. In so doing, I formulated codes that best described the interviewee's statements and that stuck closely to their language. Overall, the 300 transcribed pages translated into roughly 1,800 coded segments.[65] As a next step, I condensed the number of coded segments further into first order codes to obtain a clearer understanding of the most important concepts.

Subsequently, following Gioia et al. (2013), the researcher aims to carve out the most prevalent concepts and to develop theory through the second order analysis. For this thesis, this process is again best described as an iterative, abductive approach. On

[64] To protect the privacy of respondents, all interviewees were anonymised.
[65] The software MAXQDA was used during processing and analysing qualitative data.

the one hand, my prior knowledge – such as the preliminary findings of my prior survey but also having engaged with ASM and poverty research – shaped the process of carving out main concepts in a deductive way. On the other hand, in cases of unexpected codes, I aimed to detach my thinking from my expectations to inductively develop concepts. This is important, as "advances in knowledge that are too strongly rooted in what we already know [might] delimit what we can know" (p. 16). Consequently, as a last step, I visualised these aggregate concepts in the form of a data structure tree. Having outlined the type of research methods adopted, this chapter discusses the choice of the case study sites in more detail.

3.3.3 Selecting the Case Study Sites

To analyse the local effects of Tanzania's ASGM sector, the thesis is built around a comparative case study design which allows scrutiny of ASGM's impact on local livelihoods and on the local political economy. Case study research not only allows the building of theory but also the testing of hypotheses (Flyvbjerg, 2011; George & Bennett, 2005). The design of this research aligns to the latter by testing to which degree ASM labour markets affect poverty outcomes. Its spatial boundaries, two local comparative case studies, allow examining the structure of two specific ASGM labour markets and poverty, adding analytical depth. Bridging the micro- and macro-perspective is another advantage (Creswell & Plano Clark, 2018; Schwandt & Gates, 2018). Here, the thesis combines primary micro-level data with a more aggregated analysis of the political economy and historical trajectory of Tanzania's mining sector.

In comparative case study research, each case is analysed in detail while the overall goal is to tease out variations and patterns across the cases (B. Campbell, 2006). Two distinct views within case study research prevail. On the one hand, an interpretive understanding, based on "phenomenological attention to lived experience" (Schwandt & Gates, 2018, p. 605), translates into narrative fieldwork types such as, for instance, life history approaches and participant observations. On the other hand, in the critical realist approach the main focus is on understanding the "mechanisms, conditions and capacities" (Schwandt & Gates, 2018, p. 606) of underlying cases to draw larger generalisations from them (Byrne, 2009). Relating these views to the previous discussion on the commensurability of research methods, the thesis leans towards a critical realist approach. I do so by applying a case study format which explores

different distributional, and thus poverty-affecting, mechanisms and links these to ASGM workers' perceptions of their living situations. This is a widely accepted practice in case study research (Flyvbjerg, 2011; Schwandt & Gates, 2018).

The choice of the case study sites, Nyarugusu and Mgusu, was based on three aspects. First, the two communities are characterised by different levels of income diversification, different degrees of ASGM production, and consequently different patterns in terms of the division and organisation of ASGM labour. This divergence allowed the exploration and explanation of contrasting developments of socioeconomic and labour market structures, and welfare outcomes. At the same time, this research avoided rush-type settlements, as this might jeopardise the comparability of the findings (Fisher et al., 2009). In the following, both study sites are introduced in more detail.

Nyarugusu Ward is a mature gold-mining settlement with a diversified local economy. Located roughly 38 kilometres south of Geita Town, Nyarugusu has been exposed to mining for a long time. Industrial mining began during British colonial rule when Nyarugusu was an outlier of the Geita Gold Mine (Jønsson et al., 2019). The Geita mine closed in 1966 and many of its workers started to engage in ASM (Jønsson et al., 2019). From the 1980s onwards, multiple gold rushes followed and Nyarugusu's population increased significantly (Jønsson et al., 2019). Mgusu Ward, around 25 kilometres west of Geita Town[66] and on the edge of the large-scale Geita Gold Mine, which reopened in 2000, is a relatively young settlement. Artisanal and small-scale miners were only attracted to the area in 1987 when gold was discovered in an area called Saragura Hills, surrounding the settlement (Mwaipopo et al., 2004). These first gold discoveries sparked an influx of migrants. In 1994, its first village chairpersons were elected but it was not until 2004 that Mgusu was acknowledged as an official, registered, village by the government (field notes, 13 October 2019). In 2014, it came under the authority of the Geita Town council (field notes, 13 October 2019). While Nyarugusu is a spread out rural ward, Mgusu is confined to a valley with the gold mined in the northern hills surrounding the village. Processing activities in Mgusu take place along the small river that runs through the southern part of the valley. These distinct geographical features translate into a second key characteristic: different types of income-generating activities.

[66] There is a paved highway for approximately 15 kilometres towards Katoro, but the last 10 kilometres are on a bumpy and muddy road which is almost exclusively travelled by motorbikes.

Nyarugusu is characterised by a strong degree of diversified livelihoods, including different types of ASGM-related activities such as mining, washing, crushing and selling mineral ore, but also subsistence farming, petty and street vending, etc. (Mwaipopo et al., 2004). In contrast, Mgusu Ward, given its scarcity of land, is mainly dominated by ASGM-related activities (Potter & Lupilya, 2016). This disparity allows analysis of different types of livelihood strategies at the household level, and more importantly, the study of spatially different forms of poverty profiles with respect to ASGM, its remuneration and labour relations. In one case the scarcity of land and the conflict arising over land use for ASGM versus farming activities has led to distinct economic activities. Ultimately, this translates into different socioeconomic realities.

A second reason for choosing these specific settlements is that they were, as previously highlighted, surveyed in 2004 by a group of local and international researchers for a policy report funded by the UK's Department for International Development (DFID) (Mwaipopo et al., 2004).[67] These 2004 data allow a comparison of poverty profiles and vulnerability dynamics for both settlements over time. During its exploratory phase, this research considered tracking the same mining and non-mining households covered by the 2004 DFID study but this proved not to be feasible, as the data were not kept by the researchers.[68] Additionally, given what we know about high inward and outward migration rates in ASM settlements (Bryceson & Jønsson, 2010), it might have been difficult to obtain a reliable sample size as attrition rates are high. Despite these limitations, that both sites were surveyed in 2004 allows a general assessment of change over time, and adds a temporal comparative element to the study.

The third and final reason is that in both communities, only one mineral – gold – is exploited, allowing a comparison of the organisation and structures of production and labour, and its regimes. The decision to concentrate on a single mineral was motivated by the factors that (i) previous studies on ASM in developing countries have shown that production structures differ greatly among different minerals (Merket, 2019); and, (ii) gold is by far the most relevant mineral in terms of employment in Tanzania (Mutagwaba et al., 2018). Additionally, in both settlements, mechanisation is

[67] Additional fieldwork was conducted by Rosemarie Mwaipopo in 2005 and 2006. The data form the basis for the 2009 publication by Fisher et al.

[68] Prior to my fieldwork stay in spring 2019, an email exchange with Eleanor Fisher as well as with Rose Mwaipopo took place. Each confirmed that the data were not stored anywhere.

low and the industry can best be described as relying on manual labour and rudimentary tools such as hammers, pickaxes, shovels, etc.

Having discussed the reasons for choosing Nyarugusu and Mgusu Ward, the next chapter outlines the conceptualisation of key concepts of this thesis for the empirical analysis. The questions asked were: how to measure poverty?; how to define the boundaries of a household?; and how to conceptualise informal work?

4 The Research's Key Concepts and Their Operationalisation

The chapter outlines how concepts such as the informal economy, the household, and poverty were operationalised in this thesis's empirical framework and outlines its political economy framework. These concepts are the pillar of this research because ASM is highly informal, the survey is centred on households, its main aim is to analyse poverty, and the empirical analysis requires a political economy framework to build on. The chapter begins by discussing different theories and concepts concerning the emergence, prevalence, and structure of the informal economy. Second, it reviews the concept of the household as a unit of analysis and how it has been conceptualised and operationalised in this research. Third, the chapter examines distinct approaches to measure poverty in orthodox and heterodox social science scholarship. Finally, the chapter presents the political economy framework that binds all these concepts and empirics together and puts forward the concept of "classes of labour" by Bernstein (2007), which it will be shown to be a useful tool to investigate ASM and poverty in Tanzania.

4.1 Exploring Theorisations of Economic Informality: Do They Keep Up With Reality on the Ground?

In Tanzania over 90% of all economic activities are informal (Golub & Hayat, 2014) and less than 6% of miners in Tanzania hold a formal mining claim (Bryceson & Geenen, 2016).[69] These marked levels of informality in the country's ASM sector render a theoretical discussion of informality necessary to outline how the concept is deployed in this thesis. To begin with, what does economic informality mean? Informal activities are not captured, observed, regulated or taxed by the state (Schneider, 2002; Weng, 2015). In other words, the informal economy is juxtaposed against the regulatory framework of the formal economy it circumvents.

[69] Note that Golub and Hayat (2014) applied a rather broad definition of informal activities, including households working in the agricultural sector, self-employed, or part-time wage employed.

Anthropologist Keith Hart (1973) in his seminal work on Ghana, analysed those eking out a living outside the formal urban labour force and first coined the term 'informal economic activities'. His main contribution was to highlight that the official numbers of high unemployment disregarded the fact that large parts of Accra's population, what he called the "sub-proletariat" (p. 61), did indeed engage in economic activities. These non-recorded activities, defined as the informal economy, begged the question of their poverty-reducing capacities for informal workers living in poverty. Conceptually, Hart put forward a binary thinking, assuming that the formal and the informal spheres can be explained by the distinction between waged- and self-employed activities. For him, a key aspect was whether or not labour is recruited permanently. If this is the case, a waged labour relation can be assumed.

Building on Hart's writings on Accra and on a report by the International Labour Organization on Nairobi (ILO, 1972), the dualist approach to economic informality emerged in the early 1970s. Dualists conceptualise informal economic activities as independent, opposite and non-related to the formal sector (Chen, 2008). For them, informality features low entry barriers, whereas the formal sector can be delineated by high entry barriers. Overall, they argue that the informal sector emerged through imbalances, which is close to a 'residualist' interpretation of development.

A second school of thought, popularised by its single most influential advocate Hernando de Soto – is the legalist camp (Rizzo, 2011b, 2017). Legalists contend that informal economies are characterised by "plucky micro-entrepreneurs", who *choose* informality, as the legal sector is, given existing inefficient governance structures, too costly for them to enter (Chen, 2008, p. 22). De Soto (1989) claims that these barriers are consciously erected by local elites to safeguard their privileges. They further argue that this "indigenous entrepreneurial dynamism" is caused by excessive state intervention, translating into a monopolisation of resources by formal companies (Meagher, 1995, p. 262). Legalists share a belief in the efficiency of market mechanisms – as opposed to government structures – in conjunction with an understanding of the informal poor as mainly self-employed entrepreneurs. Lastly, there is a claim that the urban poor in the Global South 'sit' on informal assets, "dead capital", which they should transform into commodities (de Soto, 2000, pp. 34–36).

To convert these dead assets into capital, legalists promote minimalistic policy interventions but push for enforceable property rights (de Soto, 2000; B. Verbrugge, 2015). Their view of how to overcome informality has been especially powerful in

policy circles and went in hand with a shift toward supply-side economic policies and lean governance (Portes & Schauffler, 1993). Legalists assume that informal workers have strong decision-making capacities and that they are able to exit informality if they decide to do so. Questioning these premises, Biles (2008) contends that informality is not chosen, but rather involuntary, gendered and heterogeneous. Legalists consider structural aspects to be of secondary importance and that, given a property regime with a rights-based approach, structural aspects which might otherwise prevent individuals from entering the formal economy can be overcome.

A third theoretical camp is the structuralist school which was first popularised by Caroline Moser (1978) and Alejandro Portes (Portes et al., 1989; Portes & Schauffler, 1993). Structuralists argue that informal economic activities can be understood as a subsidy to formal enterprises, because they allow labour costs to be reduced and, in essence, are more competitive. This claim rests on the premise that the formal and the informal sectors are deeply interwoven. Examples of concrete intersections of formal and informal arrangements include hiring informal workers directly off-the-books, subcontracting production, and formal companies purchasing inputs from informal operators (Portes & Schauffler, 1993). Most of the evidence for this is first-hand observational data, ranging from the construction sector in Mexico through the garment sector in Guatemala to the jewellery industry in the Dominican Republic (Portes & Schauffler, 1993). In the words of Biles (2009), subcontracting and outsourcing constitute "the primary means of linking formal and informal activities" (p. 224). Portes et al. (1989) highlight that the informal economy should not be equated with poverty, as the latter is linked to distributional outcomes while informality describes the relationship of production.

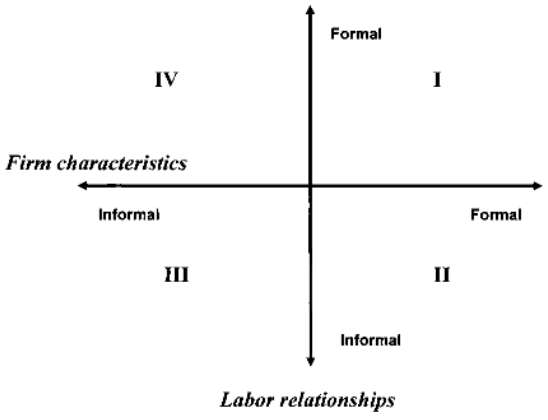
Given these different schools of thought, explanations for the emergence and prevalence of informal activities differ. Structuralists understand informalisation as a response to larger structural changes in contemporary capitalism and hence as a political process (Meagher, 1995). Thus, informalisation occurs with the government being complicit. Dualist and legalist scholars recognise informalisation as a "market-led response" from below (de Soto, 2000, pp. 34–36), yet legalists have been rather quiet on how political decisions affect the nature of, and the remuneration in, the informal economy (Rizzo, 2011) while dualists fall short of linking the formal and the informal sphere.

As indicated earlier, academic discourse has been centred around informality in the urban sphere (M. Davis, 2006).[70] A rare exception is Weng's (2015) discussion of SSA's agricultural, mining, and logging sectors. Weng highlights that complex informal rules, backed by government officials, are common across different types of informal economic activities. Further, she points out that goods which are produced informally in the domestic economy become part of global value chains. This corroborates Klein's (1999) findings on the fish trade on the Nigerian coast. In Nigeria, ties between informal and formal value chains are strong and local fisherman move from informal artisanal activities into formal work on large trawlers. Yet, this is not "unidirectional", as many reinvest the formal sector money earned in the informal sector (Klein, 1999, p. 562). These observations can be linked to the structuralist school which argues that workers shift between formal and informal work – even during the same workday (Portes et al., 1989).

This interaction of informal and formalised firms with formal and informal labour relations is also exemplified by Figure 4.1. As previously emphasised, labour arrangements range from highly informal activities such as casual labour to formal activities such as regulated employment. Quadrants I and III visualise the dualist understanding that informal employment is necessarily linked to informal employers

Figure 4.1

Dimensions of Informality



Note. Source: Biles (2009, p. 217)

[70] Most research at the intersection of economic anthropology and development studies on urban informality addresses street vending (e.g., Cross & Morales, 2007; Graaff & Ha, 2015; Hansen, 2013; Hansen & Vaa, 2004; Kinyanjui, 2014; Lindell, 2010; Staples, 2007). On Tanzania, see, for example, Tripp (1997) and Malefakis (2019) on urban informality.

whereas formal employment is to be found in formal companies. Contrary to this belief, Quadrant II highlights that informal labour activities might be brokered by a formal company: in essence, Figure 4.1 underlines that labour informality also exists in the realm of formal companies (Biles, 2009).

Motivated by a plethora of studies that are challenging the dichotomy of waged versus self-employed (Jønsson & Bryceson, 2009; Jønsson & Fold, 2011; Rizzo, 2017; Rizzo et al., 2015), this thesis aims to shed light on this "black-box" of informal economies (Meagher, 2010, p. 16) with respect to Tanzania's ASGM sector. By analysing this specific sector, it aims to explore the relations between different informal employment statuses. Moreover, this research seeks to add to the larger debate on economic informality and on rural labour markets as a site of accumulation and survival. With respect to the conceptualisation of informality in this thesis, the following can be said. Drawing on Chen (2008) and B. Verbrugge (2015) – and acknowledging the pronounced internal differentiation of informal labour markets – I contend that different conceptualisations of informality help to explain distinct fragments within informal sectors. Therefore an integrative framework, in the same vein as Chen (2008) is adopted. Here, emphasis is laid either on exit, entry, exclusion, or exploitation as explanatory channels in the informal economy.

Another work of central importance to this thesis is that by B. Verbrugge on the Philippines (2015). He argues that research on informalities in ASM has been centred around legalist explanations grounded in a dualist understanding of formal and informal mining activities. This has translated into a lack of understanding of the reasons behind failed formalisation activities in the sector in many developing countries.[71] Following B. Verbrugge's framework, the following analytical layers will be examined in my work. First, I aim to understand the internal differentiation of the labour forces across the two case study sites. Second, grounded in Chachage's (1995) seminal work on the history of mining in Tanzania, the interplay between Tanzania's informal ASM and formal LSM sectors requires analytical scrutiny. A third layer to understand the informal ASM sector in Tanzania more comprehensively is the role of the state and its different agencies (B. Verbrugge, 2015). To this end, my empirical data allow the fleshing out of this specific conceptualisation of informality and a more holistic analysis

[71] The debate on the formalisation of ASM activities is dominated by country case studies. On Colombia, see, for instance, Veiga and Marshall (2019) and for a legalist perspective on Uganda's formalisation process, see Siegel and Veiga (2009).

of the prevailing social and economic realities in the context of ASM labour markets and their effects on poverty.

4.2 Defining the Household, and Considerations Arising

Defining the concept of the household and its boundaries is crucial as it is the unit of analysis of any household survey. Importantly, distinct conceptualisations of the household translate into different outcomes of its (true) size and composition, and further into distinct estimates of assets, income, and consumption. To get this right, it is salient to integrate the Tanzanian context and cultural specificities into the definition. The concept of the household and its internal dynamics have received the attention of both orthodox and heterodox, especially feminist, economists (Berik, 1997; Fine, 2016; Folbre, 1986; Kabeer, 1997; Power, 2004). The following paragraphs synthesise these discussions and outline how this thesis conceptualises the household.

Orthodox economists define the household as a "domestic unit with decision-making autonomy about production and consumption" (P. Roberts, 1991, p. 60). This long-standing concept describes society's smallest economic unit.[72] We have already discussed in Section 1.3 that orthodox microeconomics is based on methodological individualism. This methodology assumes that an individual's decisions can be entirely explained by rational choice. Neoclassical economists contend that households are an altruistic unit and that each household member acts to maximise the household's welfare function (Becker, 1981). This argument was first presented by the theoretical school of New Household Economics (NHE) in the early 1960s. Conceptually, Gary Becker and Jacob Mincer, the school's most prominent scholars, applied microeconomic modelling of how a firm's production is organised to the household sphere.[73] Becker (1965) combined economic rationality with the theory of the firm which led to an understanding of the household as a consumer *and* producer in the marketplace. The household gains utility not only from consuming, but also from producing subsistence goods. In this sense, the household became the most relevant unit of utility maximisation (Evans, 1991). Within the NHE framework, the division of labour is explained by comparative advantage (Becker, 1981), i.e. a situation in which

[72] The concept of the household dates back to Chayanov's work on Russian peasants in 1926 (Chayanov, 1986, as cited in Haddad et al., 1997).
[73] A long-standing critique of Becker's work is that it treats the "non-economic as if it were reducible to as if market activity" (Milonakis & Fine, 2009, p. 296).

existing market differentials lead to an efficient and functional outcome; hence, females, given their lower expected wages, pursue domestic tasks while males work for an outside wage. Thus, prices, in the form of market wages, are allowed to differ among household members while it is assumed that all resources are pooled (Alderman et al., 1995). However, NHE fails to explain how resources are distributed within the household.

The assumption of altruism circumvents the neoclassical problem of non-additivity of different sets of preferences and tastes of each household member by assuming that all members subordinate their individual ambitions to a common household goal.[74] As this assumption begs the question of how common goals are formulated *and* equally put into practice by all household members, Becker introduces the concept of the benevolent dictator. He assumed that the head of the household acts in accordance with the common household goals ensuring "altruistic decision-making outcomes while his utility function represents the households' utility as a whole" (Kabeer, 1997, p. 263). The concept of the benevolent dictator is applied in cases where an altruistic bargaining consensus could not be established (Kabeer, 1997). However, this conceptualisation of real intra-household decisions has been criticised from different perspectives.

Feminist economists argue that NHE fails to grasp the complex nature of the household in the form of "interdependent and interconnected" relations (Power, 2004, p. 7; Stevano, 2014, p. 50). Abstaining from the premise of rational choice, they argue that decisions are influenced not only by non-utility maximising behaviour but also by intra-household power relations (Kabeer, 1997).[75] Intra-household bargaining power is said to "reflect the relative strength of their breakdown or fallback position" (Kabeer, 1997, p. 263); for example, the male household member might be the only one working, or earning the most, and thus hold a more powerful intra-household bargaining position than his spouse. Even though bargaining processes are nested into orthodox conceptualisations of household decision-making (see, e.g., NHE), the internal power dynamics resulting from, for example, lower female incomes, are underexplored

[74] This is because individual utility is unobservable, and preferences can only be ranked in ordinal terms. Therefore, utility curves cannot be compared or aggregated (Arrow, 1978). The literature on social choice discusses this in detail. One way of solving this aggregation problem is to assume the pooling of resources through consensus (Samuelson, 1956). However, Samuelson did not provide details of how this could be achieved (Alderman et al., 1995).

[75] In Becker's conceptualisation of the benevolent dictator, power is contended to be positively linked to altruism (Kabeer, 1997).

(Agarwal, 1997; Stevano, 2014). Lastly, orthodox conceptualisations of the household misleadingly assume that western cultural and social norms of the nuclear family with a male household head can be applied to the African context (Mackintosh, 1989).

In their critiques of NHE, feminist scholars draw on anthropological research concerning households. For anthropologists, the categories adopted by economists to differentiate households are not very helpful. They argue instead that a household is neither necessarily constituted by joint consumption nor by reproductive or productive tasks alone (P. Roberts, 1991). Instead, anthropologists argue that no universal definition ought to be claimed and that definitions of the household are different across societies and even within a society (Gittelsohn & Mookherji, 1997). Thus, they emphasise the necessity of applying local understandings of the household, because the outsider's view might substantially differ from the insider's perspective (Gittelsohn & Mookherji, 1997; Stevano, 2014). For instance, in some societies a household helper might be living within, and contribute to, the household and hence be considered a household member (P. Roberts, 1991). In others, they would be defined according to their functional task and thus not conceptualised as household members.

This latter point is linked to how a household's composition might change over time. Here, anthropologists distinguish between open and closed households (Randall & Coast, 2015). A closed household focuses on investing in and supporting the nuclear family, whereas an open household concentrates on providing support to a wider range of kin. Understanding this (in)stability of household membership in developing countries requires more empirical grounding.[76] One alternative would thus be to look at individuals, allowing an analysis across occupations, genders, and ages of household members. However, this disaggregated perspective might come at the cost of losing track of "networks of inter-independence and distribution, both within and beyond domestic units" (Whitehead, 1981, p. 98). This (in)stability of households and its implications for the ways in which surveys are conducted is barely acknowledged in research designs in mainstream economics. Here qualitative methodologies can help to understand context-specific conceptualisations of the household (Stevano, 2014).

[76] One exception being Halliday's (2010) findings on El Salvador. The study seeks to understand to what degree the structure of a household changes, as surveys only record households' structure at one point in time and do not account for changes during the recall period. Halliday (2010) found that less than 50% of households remain stable over time.

Adding to the feminist and anthropological critique of neglecting conflict among household members, Marxian scholars contend that conflicts along the class position of individual household members are underexplored. Drawing on Folbre (1986), feminist scholars criticise Marxian economists for aggregating individuals into classes based on their household membership while disregarding intra-household dynamics. Folbre (1986) pointed out that both neoclassical and heterodox economists under-analyse both gender-related conflicts and inequality within the household sphere. Feminists argue that it is inconsistent to conceptualise individuals as being entirely selfless in the family and, at the same time assuming they are entirely selfish in the market, where there are no interdependent utilities. Yet, individuals do not behave entirely altruistically nor egoistically in the household. Their actions may be characterised by some degree of reciprocity, which in turn, can be a source of conflict, if tacit intra-household agreements are not fulfilled (Folbre, 1986).

Acknowledging that resources are not shared equally within the domestic sphere is in contrast to the neoclassical household model. The NHE framework is unitary whereby the household is assumed to behave as if it were a single individual. This implies that all household members maximise their utility based on an array of preferences derived from an aggregated utility function and a common budget constraint (Agarwal, 1997).[77] However, this research, in line with the work by feminist scholars, argues that decisions are influenced by non-utility maximising behaviour and intra-household power relations. Thus, distributional outcomes in the household and how these occur ought to be analysed by acknowledging the role of power as well as the structural position of an individual within the household and in society.

Having said this, this research understands households as both economic *and* social units. This means that during the data-generating process, we probed how many individuals financially constituted the household by asking who was contributing or receiving monetary support. For example, household helpers were thus included in the household roster as they both contribute to the household and also receive financial

[77] In contrast, collective models, characterise household members to have individual preferences and to engage in intra-household bargaining (Kandiyoti, 1998). Collective models are conceptualised differently. Cooperative models assume that individuals form a household because it is more "beneficial for each party than remaining unattached" (Mattila-Wiro, 1999, p. 6), while non-cooperative approaches reason that a household consists of distinct economies and that enforceable contracts do not exist (Mattila-Wiro, 1999). One example is the Carter-Katz model (1997) which aims to integrate institutional aspects found through ethnographic research.

support. Moreover, even though this research does not engage in a deeper analysis of intra-household conflict, it acknowledges the ways in which gender and class affects distributional outcomes and the access to power.

4.3 Measuring Poverty – Linking Survey Evidence to a Respondent-Based Approach

As this thesis explores the impact of ASM on poverty, a discussion of how poverty is defined, measured, and operationalised is crucial. Defining and measuring poverty is, and has been in the past, and still is, contested scholarly terrain. Money-metrics apply income or consumption data from household surveys and compare them to a poverty line.[78] The line is constructed either by quantifying the minimum calories required, the food poverty line, or by adding to this the costs of a person's non-food basic needs, the basic needs poverty line. Households with incomes or consumption levels below either of them are defined as poor. The number of people below a poverty line is then called the headcount ratio (HCR). These money-metric measures of poverty are thus indirect, as they assume that a shortfall in income or consumption equals a loss in welfare (Fischer, 2018). Non-money metric empirical applications include the capability approach, the social exclusion approach, and participatory poverty assessments.[79] As a more detailed discussion of these approaches is beyond the scope of this research, the next paragraphs examine the development of money-metric based measures.

First conceptualisations of money-metrics date back to Rowntree's (1902) classical contribution on poverty in York, England, in the late nineteenth century.[80] He defined extreme poverty as a situation in which "total earnings are insufficient to obtain

[78] The term 'money-metrics' rather than the generally used 'monetary measures' is applied by Fischer (2018) to highlight that monetary measures not only include monetised incomes but also incomes stemming from own-account production. The latter are included by applying market prices to these self-consumed goods.

[79] The capability approach (CA), championed by Sen (1985, 1993), highlights that sufficient income does not necessarily translate into the desired outcome, for example, an improved standard of living or nutrition (Fischer, 2018). The social exclusion (SE) approach, even though a contested term, can be defined as not being able to "participate in the normal activities" of society for reasons beyond one's control (T. Burchardt et al., 1999, p. 229). Participatory poverty assessments (PPA) criticise most measures of deprivation as being externally defined and failing to ask the people living in poverty themselves about their situation (Laderchi et al., 2003). A comprehensive discussion on operational challenges and the commensurability of distinct approaches can be found elsewhere (Laderchi et al., 2003).

[80] Ravallion (2016) provides a comprehensive overview of the history of thought on poverty measurement.

the minimum necessaries for the maintenance of merely physical efficiency" (p. 86). After consulting contemporary nutritional experts, he assumed that an adult man required an average caloric intake of 3,500 kcal and then added expenses for clothing and shelter. Thus, primary poverty was defined as a lack of income to satisfy basic physical needs. Rowntree introduced a second, more extensive, measure of deprivation, "secondary poverty", by considering living conditions of "obvious want and squalor" (p. 115). Secondary poverty refers to situations where income is sufficient, yet, money is spent on other "expenditure, either useful or wasteful" (p. x). Rowntree (1902) reported 27.84% of York's population as poor, while Booth (1889) found a rate of 30.7% for London's inhabitants.[81]

From a methodological perspective, both studies sought to define poverty objectively and externally (Laderchi et al., 2003). Yet, the operationalisation of both categories by Rowntree raises doubts. First, it is assumed that "an objective condition termed poverty" exists (Laderchi et al., 2003, p. 248). Rowntree's notion of "obvious want and squalor" (p. 115) is subjective and so is his understanding of use- or wasteful consumption. In his words (1902):

> Direct information was often obtained from neighbours, or from a member of the household concerned, to the effect that the father or mother was a heavy drinker; in other cases the pinched faces of the ragged children told their own tale of poverty and privation. (pp. 115–116)

Obtaining information from 'neighbours' or through only observation speaks against an objective assessment and for one that is shaped by the enumerator's subjective views. Additionally, defining poverty externally, and not by asking the people living in poverty directly, also carries the risk of imposing an understanding of their basic needs that is detached from their reality and shaped by the researcher's views. This is exemplified by consulting nutritionists to define the average calorie needs of people living in poverty instead of asking respondents directly what they thought an adequate diet would consist of and whether they could afford it.

Moreover, there is an ongoing debate concerning relative and absolute measures of poverty. Absolute implies that there exists an objective monetary threshold, linked to a specific set of qualitative and quantitative consumption, under which people are

[81] The numbers indicate the degree of secondary poverty. Rowntree (1902) discusses the comparability of both studies in more detail (pp. 298–301).

living in poverty (Laderchi et al., 2003; Ravallion, 2016). Rowntree and Booth both championed this understanding of poverty (A. Deaton, 2004; Ravallion, 2016).[82] The practice of linking nutritional thresholds to welfare advocates the idea that a "subsistence" level can be measured (Townsend, 2006, p. 18). At the same time, it has been argued that looking predominantly at physical needs shaped the scope of poverty assessments in the 20th century (Townsend, 2006). In this regard, Fischer (2018) contends that Victorian and liberal ideas of how people living in poverty ought to consume still prevail today in the form of scholarly works addressing how they should live and what they should and should not do. This emphasis on physical needs is argued to neglect the role of social needs (Townsend, 2006), and this critique has led to the emergence of the concept of relative poverty. Here individuals are defined as deprived when the sum of their resources do not allow "them to fulfil the elaborate social demands and customs which are placed upon citizens of that society" (Townsend, 2006, p. 21). Its proponents contend that what is considered as poverty changes over time and depends on social norms (Fischer, 2018), while its critics argue that this renders any poverty exercise subjective (Sen, 1983).

Applying money-metrics to define food and basic needs poverty is now the orthodoxy when measuring poverty in economics and has translated into two distinct methodologies (Deaton, 2004): the Food-Energy-Intake (FEI) approach, where respondents are asked what their expenditure or income needed for their required diet is (Arndt et al., 2017; Ravallion, 2016) and the Cost-of-Basic-Needs (CBN) approach. The CBN either asks for the food-energy and non-food requirement, or defines and costs a list of basic needs (Laderchi et al., 2003; Ravallion, 2016).[83] The CBN resembles Rowntree's poverty assessment of York's inhabitants at the beginning of the twentieth century, as both base their income estimations on calory requirements and combine them with expenses for non-food needs (Laderchi et al., 2003).

Drawing on the FEI approach, the food poverty line is calculated as follows. First, researchers define a minimum nutritional level which is thought to satisfy the physiological needs required; then, based on this, they define a subsistence food basket

[82] Ravallion (2016) argues that poverty measures based on income and consumption respectively ought to be understood as a proxy of a household's welfare.

[83] In practice, food bundles are computed by looking at local food tastes. To this end, statisticians consider consumption patterns of households in a specific region, looking at household expenditure surveys. Consumption patterns of households that are located in the percentiles around where the poverty rate is estimated are thereby of particular interest (Ravallion, 2016). This is also called the lower-bound approach. One alternative is to rely on a local expert group to define the food bundle (Ravallion, 2016).

with specific prices and set a country-specific poverty line.[84] Subsequently, they compare this poverty line to household expenditure and/or income data. The data are adjusted to a household's specific structure by calculating its equivalence income and those households indicating a lower equivalence income than the poverty line value are considered to live in poverty. As these technical steps are based on methodological choices grounded in implicit assumptions, the next paragraphs spell out these different steps in more detail.

First, by defining the minimum number of calories required, researchers make a number of assumptions concerning the physiological needs of individuals. Establishing an average food-energy requirement has been subject to controversy (Deaton, 2018; Saith, 2005). Any threshold is inevitably linked to normative choices concerning the quality and types of food consumed as a person's calorie needs vary over time and depending on the type of work pursued. Research has shown that people living in poverty are more likely to engage in manual labour, and work harder and often longer than others, and so have higher physiological demands (Fischer, 2018). Manual labour, such as ASM, requires a daily intake of 3,500–4,000 kcal (Dasgupta, 1995). Establishing a general nutritional level across the sampled individuals implies that individuals that do not match this average calorie standard are misrepresented. Tanzania's latest poverty assessment, conducted by the World Bank (World Bank, 2015), assumed a nutritional requirement of 2,200 kcal per adult per day, but some scholars have argued that nowadays an average intake of 2,100 kcal has become standard (Haughton & Khandker, 2009; Saith, 2005). However, assumed calorie intakes are distinct across SSA countries. While in Kenya (2,250 kcal) and Ethiopia (2,200 kcal) similar rates were applied, Rwanda (2,500 kcal) and Uganda (3,000 kcal), among others, adopted higher calorie requirements per adult (World Bank, 2015).[85] The reasons for these different rates are not straightforward.

As lower calorie requirements translate into lower poverty rates, it might be politically desirable to adopt lower norms as this is more likely to suggest developmental progress. Further reasons might be that government budgets are tight and anti-poverty policies costly (Fischer, 2018)[86] or that policy makers might be

[84] For a detailed account of the calorie approach see Deaton (2004). For a detailed discussion on absolute versus relative poverty lines see Hanmer et al. (1999).
[85] The classic source for metabolic requirements referenced by, for instance, Dasgupta (1995), is WHO (1985).
[86] See, for example, Deaton (2010) on the case of India.

particularly inclined to uplift individuals close to the poverty line to maximise visible measures of their success (Ray, 2015). Thus, individuals further away from the line might be systematically discriminated against as supporting them yields no measurable/visible impact. In addition to these political incentives, it has been argued that calorie requirements were scaled down over the 20th century (Sathymala, 2016, as cited in Fischer, 2018). The practice of setting inferior nutritional norms for certain groups dates back to mid-19th century policies regarding the working class and people living in poverty. Nowadays, as Fischer (2018) suggests, this analogically applies to people living in poverty in the Global South.

The discussion on calorie norms highlights that poverty measures are shaped by normative decisions and underlines the need to unpack the power dynamics shaping methodological choices. The latter is linked to methodological criticism with respect to the assumptions on which poverty lines are based. Helwege and Birch (2007) point out that researchers are well-aware of the implications of methodological choices made during poverty assessments and how this might affect their results. This requires the researcher to openly discuss the reasons for adopting a specific approach, albeit without translating into methodological fetishism (Fischer, 2018). As there is no explicit theory on where the line objectively should be set, "various technical solutions have been suggested for this differentiation, notwithstanding the fuzziness of the theoretical framework that underlies it" (Laderchi et al., 2003, p. 249). These technical solutions range from counting calories in the form of diaries, establishing a nutritional cut-off line and adjusting price indices – all to calculate a specific income threshold under which one is considered to live in poverty. The next paragraphs examine the implications behind methodological choices in more detail.

First, money-metric measures are grounded in the assumption that income, expenditure, and/or consumption are correlated with other measures of poverty (Ravallion, 1992) and that a comparative analysis across different economies is feasible. However, comparing countries by looking at cross-country data has been criticised by researchers for numerous reasons. National poverty assessments are argued to be based on very different methodologies on how lines were calculated, rendering a meaningful comparison difficult. Examples concern changing reference levels, prices, and consumption baskets (Hanmer et al., 1999). Adding to this, constrained capacities of national statistical agencies harm the quality and quantity of data and hence limit the explanatory power of cross-country comparisons (Fischer, 2018; Jerven, 2013).

Second, poverty lines are sensitive to price adjustments. This is problematic, as in many poor countries a clustering around poverty lines occurs (Fischer, 2018). Consequently, slight recalculations of the basket of goods consumed with reference to its pricing may result in substantive changes in the levels of poverty reported (Székely et al., 2000). At the same time, individuals might face very different prices. Fischer (2018) contends that because, generally, rural households are subject to higher prices, they are not able to buy in bulk – and because they are not able to buy in bulk, they are subject to higher prices. Adding to this, relative price levels might be higher in remote areas as transportation costs, caused by poor road infrastructure (Ravallion & Bidani, 1994) in combination with volatile fuel prices (Jerven, 2015), are higher.

Third, money-metric poverty exercises assume that economies of scale unfold because the members of a household share resources. The larger the size of a household, the stronger this effect might be. To account for this, the concept of household equivalent incomes is applied (Förster, 1994), which is "the ratio of the cost (to a household) of achieving some particular standard of living, given its demographic composition, to the cost of a 'reference' household achieving that same standard of living" (J. Banks & Johnson, 1993, p. 4). The underlying assumption is that households differ in their age, gender and labour composition and hence require different calorie levels. Thus, a modified consumption unit scale is adopted wherein the first adult in a household receives a weight of one, each further adult receives a weight of 0.5 and all children receive a weight of 0.3 (OECD, n.d.). The cut-off line between children and adults varies between 14 to 18 years of age (Förster, 1994). It is important to highlight that applying a specific scale implies not only technical assumptions but also normative choices: scales attributing greater weight to each additional household member lead to higher poverty rates among young children and lower rates across the elderly (OECD, n.d.). Similar to the previously discussed practice of applying OECD-country labour survey modules to less developed economies, OECD-weights might not be equally applicable in the context of low-income countries with large household sizes. For example, a lower weight of 0.5 for over 18s might be problematic, as at this age many might be working, leading to higher metabolic needs and hence consuming a larger than predicted share of household resources. Further, the scaling exercise entails the analytical caveat that the outcome of the poverty exercise applies equally across all household members (Saith, 2005). Hence, a differentiation within the household is not possible.

Having outlined the methodological underpinnings of establishing a food poverty line, the basic needs poverty line is discussed next. The basic needs poverty line is set by adding the cost for the calorie requirements of the food poverty line to the cost of a non-food consumption budget. Usually, this budget is around 50% of the budget required to meet the food poverty line and is then added to the food budget to calculate the basic needs poverty line (Ravallion, 2016; Saith, 2005). In addition to the methodological problems concerning the food poverty line, a key criticism of the basic needs line is that it does not take into account whether or not a household is actually able to satisfy its needs, for example, in terms of accessing public infrastructure. Here, it is implicitly assumed that public provisioning is primarily a matter of income but it fails to factor in the pronounced spatial differences in terms of public provisioning within developing economies (Saith, 2005). As there might be systematically poor access to public services in rural areas, even a high-income household located there might find it difficult to access public provisioning despite its financial means. Such systematic structural differences are not accounted for in basic needs poverty exercises and rarely accounted for in practice (Ravallion, 2016).

Views on choosing either income or expenditure data differ and the two data sets yield different results (Hussain, 2003). On the one hand, Fischer (2018) suggests that expenditure-based metrics are more reliable than income-based measures as (i) people might underreport their incomes, (ii) it is easier to recall what was spent than what was earned, particularly in cases when income is paid daily and varies from day to day, and (iii) they are less volatile than income data, as incomes are particularly volatile in rural areas due to seasonality. On the other hand, Mwaipopo et al. (2004) argue that recalling expenditure data might lead to distorted evidence, and that there are also incentives to understate household expenditures, for example, to be eligible for social benefits. Further, social (un)desirability of some items of expenditure (e.g., household members avoiding disclosing all or some socially undesirable expenditures such as alcohol), knowledge and/or memory bias (e.g., lack of awareness of what others have acquired), and quantification issues are further known problems of expenditure recalls (Wall & Johnston, 2008). A related issue is that expenditure-based poverty lines provide no information about the long-run viability and impact of these expenses. This is exemplified by Saith (2005), who argues that the forced sale of land due to hardship might enable a household to temporarily jump above the poverty line even though this negative shock is clearly detrimental in the household's medium- to long-run economic

welfare. Likewise, income-based lines do not elucidate on the sources of income, for example, the sale of assets.

Given the shortcomings linked to income and expenditure data, some scholars promote consumption-based indicators to measure poverty. Consumption measures are argued to be a robust proxy given the assumption holds that households smooth their consumption over time (Deaton, 2000; Morduch, 1995). Own-account production of goods and services, effectively household income, are not captured by either income or expenditure and are therefore only imputed. For consumption data, own-account production is considered, which is argued to be one of its advantages (NBS, 2014).[87] However, Parker (2015) brought forward empirical evidence that people living in poverty are simply unable to smooth consumption over time. This is because of substantial income volatility over the year, for example between the rainy and dry seasons (Fischer, 2018) and high one-off expenditures, for example, for festivities such as funerals and weddings (Banerjee & Duflo, 2007). Moreover, collecting consumption data is very time-consuming as it involves food diaries and gathering each household member's expenses over the reference period.

The criticism of income- and expenditure-based poverty measurement spearheaded the development of another methodology: the usage of assets to analyse poverty and wealth differentiation (Johnston & Abreu, 2016). The central premise of this approach is that observing a certain level and composition of asset ownership allows the researcher to differentiate households living in poverty from households that are not. This is grounded in the premise that proxies – as wide-ranging as access to sewerage and electricity, housing characteristics, the number of sheep, mobile phones, etc. – are correlated well enough with changes in income levels identifying deprivation. Asset-based measures are asserted to be more accurate than expenditure or income data as they are directly observable, making under- or over-reporting to perceived social (un)desirability more difficult and less resource-intense to compile in the field (Howe et al., 2008; Vyas & Kumaranayake, 2006). However, asset-based approaches are also subject to criticism.

One is that assets are of different value across different sites, rendering a comparative analysis difficult. Two examples illustrate this. First, housing

[87] For the latest Tanzanian poverty assessment in 2011/2012, a consumption-based approach was pursued. The food poverty line was calculated on a calorie intake of 2,200 kcal per adult per day reflecting the assumed food basket consumed by 10–50% of the population (NBS, 2019).

characteristics might not be a reliable predictor for actual household wealth given the migratory nature of ASM in Tanzania and the widespread fear, by miners, of being evicted (Mwaipopo et al., 2004). This migratory nature relates to the rush-nature of some mining sites as well as the fear of being evicted. Second, given different cultural values across mining communities, consumption items such as mobile phones, radios or bicycles are not a reliable measure of the owner's poverty status (Mwaipopo et al., 2004). Thus, their explanatory power as a proxy for wealth differentiation is limited. Take the example of owning a cell phone; during our qualitative interviewing, we realised that the vast majority of respondent households owned a cell phone. In 2004, the situation must have been very different, as cell phones were much more expensive and thus a much better predictor to differentiate across overall household wealth than in 2019.[88] This point is corroborated by Harttgen et al. (2013) who state that "preferences for certain assets might rise over time as assets become more prevalent and part of "normal" living conditions. This might particularly relate to … media and telecommunications equipment" (p. 41). The point above, thus highlights the importance of taking into account the context- and location-specific preference on consumption and asset-owning when choosing a methodology to assess poverty.

The quality of asset-based measures to proxy consumption has also been questioned as well. As outlined by Harttgen et al. (2013), assets might be accumulated in the absence of real income growth, a phenomenon called asset drift. Looking at data from the Demographic and Health Surveys (DHS) from 33 African and 34 non-African countries, they argue that asset indices are a good proxy for consumption at a given moment in time. Yet, they also contend that asset-based approaches lead to biased evidence when measuring trends in consumption over time. Their empirical analysis suggests that TVs and cell phones in particular are subject to asset drift, as their prevalence is shaped by decreasing relative prices, changing preferences, and is affected by public policies, the aging of assets, and accumulation patterns.

Having outlined the advantages and disadvantages of asset-based, consumption, income, and expenditure approaches to establish a quantitative poverty line, it becomes evident that the multidimensionality of deprivation cannot be comprehensively analysed through either money-metrics or asset-based approaches *only*. Likewise, this

[88] During our stay we observed that, given the low levels of electrification, industrious locals had started small businesses charging cell phones.

thesis, in line with Hussain (2003), applies income and expenditure recall data to calculate food and basic needs poverty (Section 7.1.2). Acknowledging possible deficiencies of externally defined measures of deprivation, however, these findings are triangulated by qualitative interviews at both case study sites (Section 7.2). Interviews with ASM households focused on self-perceived poverty and the role of ASM in this over time. My qualitative research thus helps to engage in a critical discussion, juxtaposing quantitative measures of deprivation with ASGM workers' insight into the dynamics of labour and poverty, as suggested by Sender et al. (2006). This research puts forward a mixed approach towards poverty research, arguing that poverty research unquestionably has to actively engage with the people experiencing such living conditions.

4.4 Political Economy and Theoretical Framework

Central to the thesis's theoretical framework is its attention to the microeconomic dimension of ASGM, linking this to a broader analysis of the political economy of its labour markets. As, argued in Chapter 2, labour markets are internally distinct and consist of "qualitatively and quantitatively different segments" (Mueller, 2015, p. 154), specific to context and history, and function differently from one another (Fine, 2007). The thesis embeds these assumptions in a critical realist ontological understanding of reality as layered, rejecting both a mechanistic understanding of labour markets as well as the notion of individuals as atomistic. In doing so, this work understands the relation between supply, demand, and wages as non-functional, and social structures as embedded in these labour markets.

At the same time, how we understand how the relationship between economic and social forces shapes supply and demand is contested. Martin (2000) writes, "at one extreme, the local labour market is assumed to function as a set of impersonal demand and supply interactions; at the other, as a power saturated, institutionally constructed social process" (pp. 463–464). This latter understanding highlights that a person's position in social and economic structures shapes labour market outcomes decisively. This thesis, however, avoids a one-sided reading, acknowledging both the economic and social structures of ASGM labour markets. Hence, a pronounced focus on the structure and social relations constituting labour markets is set, exploring the ways in which labour markets (have) shape(d) the mode(s) of accumulation in the ASGM sector.

To this end – drawing on the works of Bernstein (2007, 2010), Breman (1996), and Lerche (2010) – this research pursues a socioeconomic account, informed by attention to class relations, and based on empirical data. As outlined in Section 0, its research question was operationalised by enquiring who owns what, what are they doing and how much are they earning. To link these questions to a relational understanding of poverty and labour, the research draws on Bernstein's (2007, 2010) 'classes of labour' framework, which asserts that workers in the Global South experience heterogeneous labour conditions. This heterogeneity, in terms of employment statuses and jobs, affects the ways in which they can exert bargaining power and which structural barriers can be overcome which, in turn, translate into social differentiation across workers in rural labour markets. The concept includes not only workers in informal labour relations who are subject to "insecure and oppressive" wages (Bernstein, 2007, p. 6) but also self-employment that is effectively disguised waged employment and a combination of precarious self- and waged employment.

The classes of labour framework might complement existing research on ASGM labour markets and poverty, and influence attempts to grasp the multiplicity of activities and "jobs" carried out by people living in poverty. Transferring these categories to my own work allows a better conceptualisation of the heterogeneity of individuals' experiences engaged in ASGM in Tanzania. This conceptualisation of the sector therefore combines scholarship on agrarian change, and its insights into de-agrarianisation and labour markets, with that on informal artisanal and small-scale extractive economies.

Having established the thesis's conceptual and theoretical framework, the next chapter, which precedes the empirical core of this thesis, focuses on examining the political and structural shifts in Tanzania's ASM sector over time. The analysis will focus on how the organisation, distribution, and exercise of power by smallholders, state actors, investors, and others – all constituting the ASGM sector – has changed over time. Particular attention is paid to the historical development of institutions, whether economic, such as property rights, and their enforcement, legal, and political, for example, changes in the structure of resource governance.

5 Embedding the Study in Tanzania's Political Economy of Mining Over the Course of History

---

We have not gone to East Africa to found plantations for 300-400 people, but to make a vast country bloom, to find raw materials and create markets for German trade and German industry.

Bernhard Dernburg, Head of the German Imperial Colonial Office during Budget Commission, 25 February 1908, as cited in Iliffe (1969, p. 91)

We have one crop in this country which is undoubtedly of value for a number of years, and that is gold. There is no other crop in the country to compare with it … We as a government do realize that this gold is the only important thing in the country at the moment.

29th meeting of the British Economic Advisory Board, 2 January 1933, as cited in Lemelle (1986, p. 144)

When we came to look at Africa for mining investment, our destination of choice was Tanzania. Why? Because Tanzania has become a role model for Africa and the world in terms of creating [a] progressive economic, investment and legal climate for mining companies.

Randall Oliphant, President and CEO of Barrick Gold in July 2001, as cited in Cooksey and Kelsall (2011, p. 63)

Nyerere's philosophy was that 'minerals do not rot' and thus the country should prevent foreign investment in mining, waiting until the Tanzanian state acquired both technical and financial capacity to mine.

(Kinyondo & Huggins, 2019, p. 3)

Indigenous people [are] not benefitting, demand of small artisanal people to have mining areas set aside for them and being enabled to have access to loans, [complaints of] not paying the appropriate relevant tax, [complaints regarding] complications during payment of compensation, et cetera.

Extract from the inauguration speech of John P. Magufuli, 5th President of the URT, 5 November 2015, as cited in TZ One (2015), accessed: 2017-11-13

To map the political economy of mining in Tanzania in its political context over more than a century is challenging but essential to understand the nature of – and distribution of power in – its ASM sector today. The latter cannot be discussed without linking it to developments in the country's capital-intense large-scale mining sector. Thus, the chapter analyses ASM and LSM in conjuncture. The quotes above introduce the themes that run continually through this chapter: the conflict over resource sovereignty and the strategies of distinct actors and groups to accrue mineral revenues. The first and second quotes illustrate the extractive nature of both the German and British colonial state. The third reflects the government's pro-market approach in the 1980s and 1990s. In contrast, the fourth and fifth quotes illustrate a strategy to retain these mineral rents in the country, linking Nyerere's quest to regain resource sovereignty to the promises made by Magufuli to represent the interests of local miners. Drawing on Lemelle (1986), the chapter analyses the internal and external forces that shaped the Tanzanian state policy towards the mining sector and corresponding distribution of powers.

The chapter is structured as follows. It begins by outlining the role of mining activities during German and British occupations and, subsequently, discusses the nationalisation of the mining sector after Tanzania's independence. Next, the analysis examines the effects of economic liberalisation on Tanzania's mining codes, small miners, and investors. Sections 5.4 and 5.5 scrutinise the government's approach towards ASM and LSM during the presidencies of Jakaya Kikwete and John P. Magufuli. At this point the chapter adds qualitative data derived from sectoral stakeholders and offers a brief outlook on incumbent president Samia Suluhu Hassan's tasks ahead. Section 5.6 concludes.

5.1 German and British Colonisation: State Control and a Mushrooming, Heterogeneous ASM Sector

The first contact with gold in modern-day Tanzania traces back to the 13th century when its coastal population became involved in the East African gold trade. Even though gold was not then being mined in Tanzania, the gold mined in Rhodesia and Manicaland, both in present-day Zimbabwe, was then transported overland to Sofala, in present-day Mozambique, where it was shipped north along the coastline

(Iliffe, 1969). Even though gold was not yet mined in Tanzania, the mining and working of copper, iron, and salt already took place (Bryceson et al., 2012; Chachage, 1995).

In Kilwa, a small town 280 kilometres south of Dar es Salaam, the mined produce from Sofala was transhipped from small boats to larger vessels travelling to and from India with the support of strong seasonal monsoon winds (Bryceson et al., 2012). The main traders in the area were Arab and Omani merchants (Iliffe, 1969). Kilwa's strategic geographic position on the trade route and a peaking world gold price during 1315–1330 brought the city exceptional wealth from 1250–1330 (Bryceson et al., 2012; Pearson, 1998). However, a sharp fall in global gold prices, caused by the Black Death in Europe and the decreasing supply of gold from Zimbabwean mines, led to a plummeting gold trade in the 1340s (Bryceson et al., 2012). Kilwa's mineral trade-based economic growth slowed and in 1505 the Portuguese seized the still affluent city, taking control of the gold trade from then onwards (Bryceson et al., 2012; Coulson, 2013). However, the Portuguese left Kilwa in 1512 and, until the late 19th century, trading and mining of gold played a negligible role in the area that modern-day Tanzania (Bryceson et al., 2012).[89]

European imperialism and the 'scramble for Africa' in the late 19th century resurrected interest in Tanzania's vast and rich mineral deposits. Western powers partitioned the African continent into nation states at the Berlin Conference in 1884-1885, ignoring internal "cultural, political, and economic differences" (Emel et al., 2011, p. 73). German claims to Tanzania began with the presence of a private chartered company, the 'German East Africa Company' (DOAG) in 1884. The DOAG was technically established to realise trade profits in East Africa but effectively to create a German colony there (Emel et al., 2011; Iliffe, 1979). After acquiring 140,000 square kilometres of land from 12 local chiefs, the DOAG's leader Carl Peters, after initial hesitation, was backed by the German Empire (Coulson, 2013; Iliffe, 1979).[90] The unequal nature of the 'protection treaties' 'agreed' between the DOAG and Tanzanian local leaders is best understood by Bismarck's comment that "to acquire territory is very simple in East Africa, for a few muskets one can obtain a paper with some native crosses" (Iliffe, 1979, p. 90). From 1884 to 1886 the DOAG dispatched 18 expeditions

[89] Here a word of warning is necessary. As knowledge of Tanzania's history prior to the 19th century is generally scant (Iliffe, 1969), the statement reflects the scarcity of scholarly knowledge to some degree.
[90] Further reasons for Bismarck's policy shift to support the DOAG and the colonial project in East Africa were the Abushiri Revolt beginning in August 1888 (Iliffe, 1979) and lobbying by the Hamburg chamber of commerce and merchant capital (Gründer, 2018).

and established the same number of small trading stations (Iliffe, 1979). The company became involved not only in plantation farming and commerce, but also owned local banks and mining shares (Rodney, 1974).

In 1891, the DOAG's administrative power, particularly over land, was transferred into the hands of the German government (Coulson, 2013; Iliffe, 1979). From then on, the governor's consent was required when transferring land (Sundet, 1997). On 26th November 1895, an imperial decree was issued: territory which could not be proved to be privately owned became 'ownerless Crown land' and from then on belonged to the German colonial state (Iliffe, 1969). In 1890, present-day mainland Tanzania, Burundi, and Rwanda all became parts of German East Africa (Coulson, 2013). The efforts of the DOAG not only formed the spearhead of the foundation of German East Africa. The Land Ordinance became the building ground for a concession system which allowed the Germans to sell mineral prospecting licences to private investors (Emel et al., 2011). The main aim of the concession system was to attract private companies as the colonial state was unable to bear itself the costs of mineral prospecting (Lemelle, 1986).

In subsequent years, various gold reefs were discovered. A first important auriferous reef, named the 'Bismarck Reef', was found in 1898 by the private Koncesion Für Edelmineralien (Concession for Precious Minerals) only ten miles west of Geita Town (Lemelle, 1986). Further gold reefs were discovered southeast at Sekenke and east of Lake Victoria (Lemelle, 1986). By the end of 1910, 76 prospecting fields had been established on which 111 mining claims were located (Calvert, 1917, p. 84),[91] the majority of which sourced alluvial gold. Just before the First World War, a total of six large gold mines were active in the country, the most prominent being Sekenke, which began operations in 1909 (S. H. Frankel, 1938). In 1910, Sekenke had already produced one ton of gold and employed around 20 Europeans and 700 local workers at its peak (Bryceson et al., 2012). Nevertheless, the mineral sector – mainly consisting of gold reef-mining in the region south to Lake Victoria around Sekenke – constituted only a small share of the colonial economy (A. Roberts, 1986).

With a focus on export-orientated agriculture, the colonial economy consisted of plantation and smallholder farming but there was also a presence of white settlers.

[91] The prospecting in northwest German East Africa not only led to the discovery of gold but also to other minerals such as mica, iron, copper, garnet, uranium, lead and zinc (Bryceson et al., 2012; IBRD, 1961).

Economic exploitation in the colonies occurred through distinct economic strategies: European settler colonies such as German South West Africa and the British Cape Colony; colonial economies based on smallholder African peasant agriculture; and, large-scale plantation agriculture (Iliffe, 1969). German administrators opposed the establishment of a settler colony in East Africa as previous settlements of Afrikaners and Russian-Germans had yielded calamitous outcomes (Iliffe, 1969). The German economy in East Africa was built around cash crop production such as rubber, sisal, cotton, and coffee cultivated on European-owned plantations with African labourers, but also by peasants, and to a much smaller extent by settlers (Rodney, 1974, pp. 9-12). Thus, German East Africa's economy can be described as a combination of the above alternatives. However, it is important to stress that the direction a colonial economy took was rarely a conscious decision but rather a consequence of events (Iliffe, 1969, p. 50).

As non-capitalist production structures limited the labour supply needed to produce cash crops, the German strategy was to pressure peasants into waged labour (Lemelle, 1986). One example of this was an 'educational' hut tax introduced in April 1898 (Bursian, 1910). The tax could be paid in money (three rupees) or its equivalent in labour (20 hours) or goods (Bursian, 1910, p. 56). The aim was not only to produce crops but also to integrate colonial subjects into the cash economy and get them used to obeying the colonial government's edicts (Iliffe, 1969).

To try and solve this labour shortage, the Germans intensified taxation efforts and became more ruthless. In 1902, then-governor von Götzen drew up a cotton-growing scheme which required each adult male under the rule of a headman to work 28 days a year on delineated cotton-growing areas (Iliffe, 1969). Von Götzen's cotton scheme was a failure. Many refused to work as the wages paid were low and not disbursed until over a year later (Iliffe, 1969). Workloads were much heavier than expected, taking longer than the stated 28 days, and thus "seriously interfered with subsistence farming" (Iliffe, 1969, p. 23), and brutality, as well as corruption, were commonplace (Gründer, 2018; Iliffe, 1969). Reattempting to mobilise labour through taxation, the 1898 hut tax was changed to a poll tax in 1905. Now every adult male, not just the head of the household, had to pay a tax of three rupees, a marked increase (Gründer, 2018). Moreover, the possibility of offering goods or public labour in lieu of

paying the tax was replaced by toll work (Bursian, 1910, pp. 18–19).[92] The burdens of taxation and the injustices of the cotton-growing scheme were only two aspects of colonial occupation. Between 1891 and 1897, 61 'punitive expeditions' took place, among them the war of extermination against the Hehe people (Gründer, 2018). This prolonged interplay of indirect suppression and explicit violence helps to explain the subsequent outbreak of the Maji Maji Rebellion in 1905 (Iliffe, 1979).

The Rebellion had devastating implications on Tanzania's societies in the South. The burdens of the cotton scheme, the poll tax, as well the 1905 drought, are described as reasons behind the Rebellion which can be read as a "final attempt by Tanganyika's old societies to destroy the colonial order by force" (Iliffe, 1979, p. 168). The Rebellion began in the South-East of the country, linked to a spiritual medium named Kinjikitile Ngwale, who later called himself Bokero, claiming to be possessed by a spirit called Hongo (Iliffe, 1969). Bokero promoted that a war medicine, called maji, would allow his followers to turn the bullets of the Germans into water (Iliffe, 1969). To turn down the Rebellion, Bismarck and the German Reichstag dispatched Hermann von Wissmann. He applied a scorched-earth strategy which, combined with famine, led to the death of an estimated 300,000 Africans, around one-third of the total population prior to the Rebellion (Iliffe, 1979). Its lack of success persuaded many Tanzanians to accept European domination and to stop fighting against its impact (Iliffe, 1969).

The results of the Rebellion can be considered as a turning point in the domestic power dynamics in German East Africa. Until 1905, colonial rule was based on local compromises consisting of the "recognition of superior power, the provision of limited quantities of labour and building materials, an emphasis on diplomacy rather than force as the means of resolving disputes" (Iliffe, 1969, p. 147). This compromise went hand-in-hand with a "sub-imperialism" (Iliffe, 1969, p. 147): the supporting and playing off of certain local societies against others. After the Maji Maji Rebellion, new local compromises emerged, meaning that societies loyal to the Germans, willing to grow cash crops, and to collect taxes, were now advantaged while others lost privileges (Iliffe, 1969).

Yet, this more 'indirect rule' rule by no means meant that labour control by the German occupiers became less ruthless. The horrors inflicted by the right to 'discipline'

[92] In 1906, one idea was to resettle the inhabitants of Sukuma and Nyamwezi on the coast. They would receive a piece of land in exchange for working 90 days per year on plantations (Iliffe, 1969). However, the plan failed and many fled to neighbouring Kenya.

plantation workers through corporal punishment remained unchanged. Even though in 1906 labour control shifted from private investors to district commissioners, plantation wages were often lower than agreed, as supervisory capacity was scarce (Rodney, 1974). The fact, that between 1911 and 1912, on average each colonial district office handed down five sentences for 'excessive brutality' by the colonial officers when administering corporal punishment, provides a rough idea of what Africans had to endure (Iliffe, 1969).

Mining played a minor role not only from an economic but also from a political perspective. Even though the German colonial state actively promoted mineral prospecting and exploring, it neither provided infrastructure nor was actively involved in mining activities (Chachage, 1995; Lemelle, 1986). At the same time, a conducive investment climate with relatively low royalty rates of 1.5% and 2.5% existed in comparison to British rule when, as discussed below, royalties amounted to 5% (German Annual Reports, 1906-08, as cited in Lemelle, 1986, pp. 56–57) To conclude, gold, mainly through white settlers, was for the first time commercially exploited, while German concession companies extracted the revenues for themselves (Kulindwa et al., 2003). Estimates suggest that small-scale operations produced minerals worth GBP500,000 during German colonial rule (Kaijage, 1983b).

In contrast, compare the role and scope of mining activities during British rule. The first alluvial gold rush occurred after German East Africa had become a British Protectorate under a League of Nations mandate in 1920. During the First World War, armed conflict between German and British forces had brought mining activities to a halt (Bryceson et al., 2012) but not for long. In the first half of the 1920s, facing declining prices for cash crops (Lemelle, 1986), European settlers began alluvial mining east of Lake Victoria (Musoma District) and in the Lupa goldfields in the Southern Highlands in particular (A. Roberts, 1986). Over time, gold's importance grew and, from 1935 to 1939, it became the second most exported product after sisal (A. Roberts, 1986). Until 1961, the most common minerals exploited were gold, diamonds, lead, mica, salt, and tin (Lange, 2006).

The subsequent passing of the 1920 Mining and 1923 Land Ordinance redistributed (public) land worked by Tanzanians to the government and to private actors. In 1919, when Tanzania became administered by Britain on behalf of the League of Nations, around 1,300,000 acres of high-grade farming land was freehold (James, 1971). The British incorporated major parts of German legislation and so acknowledged

the land defined as freehold under German rule (Lemelle, 1986; Sundet, 1997). The 1923 Land Ordinance enabled the governor to annex land "in the general interest of the Territory" (Land Ordinance Sec. 6, as cited in Wily, 1988, p. 52). In practice, land primarily used for seasonal activities such as grazing and hunting, and not for permanent farming, was deemed as unowned and taken from Africans, leading to conflicts between the owners of customary rights and those formally granted rights such as freeholds (Pedersen et al., 2016). Moreover, in response to these first alluvial gold discoveries, a first mining code was drafted (Pedersen et al., 2016). The 1920 Mining Ordinance allowed the combination of new prospecting claims with former German exploration titles (Lemelle, 1986).

Despite increased small mining activities, the British colonial state hesitated to engage more actively in reef mining in the 1920s. The Lupa gold rush attracted British and South African investors, but a series of droughts caused the field's output to decline (A. Roberts, 1986). The British Government was reluctant to increase its support to the mining sector for a series of reasons. First, their mandate required them to promote "the material and moral well-being and the social progress of [the] inhabitants" (Iliffe, 1979, p. 247) and to place African over foreign interests (Bryceson et al., 2012). Thus, supporting British mining capital would have been politically risky. Second, gold prices were fixed and not very promising until 1925 (Lemelle, 1986). Last, the transfer of large areas of land was seen as a troublesome process (Lange, 2006).

The discussions leading up to the 1929 Mining Ordinance illustrate the non-monolithic nature of the British colonial state's policy towards mining. On the one hand, Governor Donald Cameron and Mining Commissioner R. Gregson Williams opined that only a concession system would attract the interest of large mining capital in developing Tanganyika's gold reefs (Lemelle, 1986).[93] Both favoured legislation which would discourage small and "penniless" miners (Lemelle, 1986, p. 93). On the other hand, the Imperial Mining Institute held the view that small-scale miners ought to pave the way for large capital investments by pursuing exploration work as "Capital normally, does not discover, it exploits discoveries" (Minute, Green to Bottomley, 1927, as cited in Lemelle, 1986, p. 95). In the end, the camp around Governor Cameron succeeded, and the 1929 Ordinance was passed, tailored towards large-scale reef

[93] According to Lemelle (1986, p. 92): "The rationale was to offer large areas of land … to highly capitalized mining companies in the hope that they would discover and develop the territory's gold reef possibilities"

mining and limiting the number of alluvial claims that could be held by an individual (Lemelle, 1986). It was not until 1931 that the small miners and their supporters were successfully pushing for a revision of the 1929 Ordinance (Lemelle, 1986).[94]

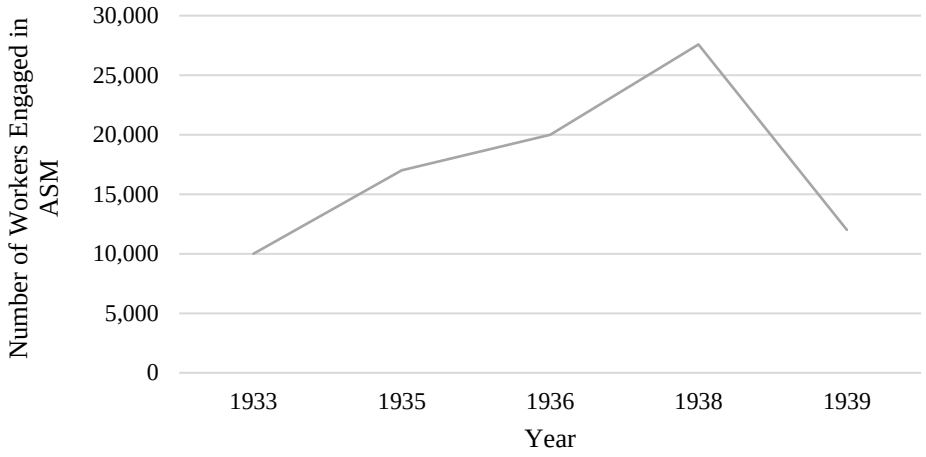
The implications of the 1929 Ordinance can be interpreted differently. On the one hand, it allowed Tanzanians to acquire prospecting rights (Chachage, 1995) and is thus sometimes described as the "birth of Tanzania's artisanal mining tradition" (Bryceson & Jønsson, 2014, p. 13). On the other hand, as outlined above, the 1929 code was geared towards large capital investments into mining as a result of British and South African investors having shown interest in 1928 (Pedersen et al., 2016; A. Roberts, 1986). Licence holders ought to be able to provide "sufficient working capital to ensure the development of and carrying on, of mining operations in the area applied for" (T.T., 1929). Thus, the 1929 Ordinance focused on promoting capital investments into mining.

The 1930s were characterised by a surge in small mining. In 1931, alluvial mining on the coastline gained momentum and the small city of Lupa experienced an influx of around 200 white men, mainly from Northern Rhodesia, Belgian Congo, and parts of East Africa (A. Roberts, 1986). The number of diggers rose to 300 by the end of 1931 and to 1,000 by 1936, while the number of labourers increased to 5,000 and 20,000, respectively (Kaijage, 1983a). Roberts (1986) confirms these numbers, reporting approximately 10,000 workers in 1933 and 17,000 in 1935. Estimates for the second half of the 1930s range from 25,000 workers between 1935 and 1939 (A. Roberts, 1986) to 27,580 gold workers and some 32,000 people engaged in the entire sector by 1938 (Chachage, 1995). As alluvial gold became exhausted and more difficult to obtain around 1939, the number of workers declined to 12,000 (Lemelle, 1986; A. Roberts, 1986). Figure 5.1 visualises this development.

[94] Surprisingly, Williams supported amending the 1929 Ordinance, most likely, as the ordinance had not been successful in attracting large-scale mining capital until 1931 (Lemelle, 1986).

Figure 5.1

ASM Employment During the Interwar Period, 1933–1939



Note: Sources: Chachage (1995); Kaijage (1983a); Lemelle (1986); Roberts (1986).

The strong surge in mineral production is ascribed to an environment of falling agricultural and rising gold prices (Bryceson et al., 2012; A. Roberts, 1986). For the Lupa field, this influx of newcomers is vividly described in the records of a government mining inspector:

> They came by bicycle, on foot, riding on donkeys, or anything on four wheels which could be induced to move. I was stationed there and saw them come … In most cases the Lupa meant little, if anything, more than a bare subsistence, but it kept the wolf from the door until better times came. (Hockin, 1952, p. 5, as cited in A. Roberts, 1986, p. 556)

Labour and living conditions in the Lupa goldfields were generally harsh but varied across the small-scale mining labour force. Labourers were employed by two categories of employers, diggers and small-reef miners: the former had no or little capital and led an unsettled life at temporary mining camps; the latter owned basic equipment and capital (Chachage, 1995). Most diggers were barely able to eke out a living; only 33% of them were running a profitable operation (Kaijage, 1983a; A. Roberts, 1986). While both diggers and labourers had to be highly mobile to exploit the next alluvial gold rush, it was natural that when diggers moved every two to three months, their labourers would follow (Kaijage, 1983a). No wages were paid when no gold had been found at the end of the working day, and the sick neither received food nor wages (Kaijage, 1983a). Housing conditions and the water supply caused diseases exemplified by the ongoing existence of scurvy and other deficiency disorders in the

late 1930s (A. Roberts, 1986). By 1934, a small but growing number of alluvial and small gold reef diggers had replaced the pre-existing community of white settlers in the area (Lemelle, 1986).

The Lupa gold rush spurred socio-economic dynamism and differentiation. Alluvial output in Lupa rose significantly until 1936 during the dry and wet seasons. The innovative adoption of drying machines, by newly arrived diggers was behind this growth (A. Roberts, 1986). Yet, only few could afford a dry blower, and "each dry blower was attended by a group of about 35 men who naturally worked under supervision" (Kaijage, 1983a, p. 8). This indicates that innovations intensified socioeconomic differentiation. Moreover, diggers in the Lupa were mainly financed by local investors, who were often ex-soldiers, ex-farmers or petty merchants (Lemelle, 1986). Further, it has been argued that the increased food demand around the Lupa goldfields led, in a localised way, to the introduction of the plough, irrigation techniques, and hybrid maize seeds from Kenya – signalling some agricultural innovation (A. Roberts, 1986). At the same time, the scale of these changes was somewhat limited, as the Lupa goldfield did not attract large capital as many investors perceived the field's quality as too insecure and the colonial state's support as too weak (Lemelle, 1986).

In the following years, reef mining around Tanganyika's Great Lake area gained importance, while many newcomers on the coast found alternative, more reliable, income sources due to improved macroeconomic conditions. The most important gold mine in Sekenke was taken over in 1928 by Tanganyika Central Gold Mines, a mining company based in South Africa (A. Roberts, 1986). A second South African-owned company, the Tanganyika Diamond and Gold Development Co. operated the Mara mine from 1935 onwards (A. Roberts, 1986). A third large-scale mine was run in Buhemba by the South Nyanza Development Co., a British firm (A. Roberts, 1986), which employed around 1,000 Africans (Kaijage, 1983a).

The situation for local labourers at larger reef-mining companies around Lake Victoria was no less wearisome than for alluvial miners (A. Roberts, 1986). Most reef-mines were subject to a high worker turnover, in places like the Geita Gold Mine from 1934-35 or in the Sekenke mine, which had a reputation of mistreating workers (Lemelle, 1986; A. Roberts, 1986). Workers were exposed to the whims of their, mostly white, supervisors and were only paid after 30 days of work. Each day was recorded on a *kipande* (labour card), which was an "instrument of labour exploitation and oppression", common in colonial Africa (Kaijage, 1983a, p. 7). Supervisors could erase,

or refuse to enter, days on the *kipande* for offences such as not obeying orders, 'misconduct' against a supervisor, or for not completing a task (Kaijage, 1983a). Not only violent confrontations with supervisors but also technical deficiencies rendered mining dangerous: conservative estimates indicated one fatality every fifth day (Kaijage, 1983a). Moreover, food rations were often inadequate (e.g. at the smaller Musoma mines) and nutritional deficiency diseases such as scurvy were commonplace (Kaijage, 1983a).

Data on wages in large-scale mining during British colonial rule are scant. Average wages of African miners had increased by 25% to Sh17 (including food rations) from 1936–1937 (A. Roberts, 1986), while another source reports that large-scale mining operations paid differentiated wages rates for drillers, blasters, drivers, etc. ranging in the late 1950s from Sh5.5 to Sh25 daily (Kaijage, 1983a). Moreover, as the larger firms extended the use of machines, they sought to offset the costs of this investment by creating incentives for African workers to work more efficiently; in 1937 the best-paid men usually earned five times as much as the lowest- paid workers (A. Roberts, 1986). Yet, as emphasised by Kaijage (1983a), this went together with a paternalistic and often inhumane monitoring, controlling, and supervising of African labourers by white overseers.

We saw earlier that, in the late 1920s, the British colonial administration had contrasting opinions about the role that external capital and white diggers should play in the development of the mineral sector. The conflict re-emerged in the 1930s in face of the needs to appease local diggers and to attract mining capital that emerged. On the one hand, the colonial state was aiming to attract large capital for reef mining so that it could accrue revenues from royalties, taxes, and railroad duties (Lemelle, 1986). This position was supported by the Commissioner of Mines, B. F. Frayling, who opined that only large mining capital could properly develop the colony's mining sector (Lemelle, 1986). On the other hand, E. O. Teale, the Director of the Geological Survey Department, lobbied for the interests of diggers, arguing that assisting small miners would attract large-scale mining capital (Lemelle, 1986).

Despite publicly emphasising a dual strategy, the colonial state implicitly adopted a position in favour of LSM as a letter from the Deputy Chief Secretary to the Chief Secretary indicates:

> The fact remains that although they [small miners] have been there for 10 years, they have done nothing beyond alluvial mining and have not the capital to

> develop the reefs. The issue therefore, is economic versus political and as it is in the interests of the country as a whole that the area should be developed by a syndicate with sufficient capital, the first consideration [i.e. economic] should prevail. (Tanzania National Archives 20429, May 3, 1932, as cited in Lemelle, 1986, p. 156)

The extract highlights that, despite the demands of the white digger community and its publicly voiced dual strategy, the colonial administration retained the view that large mining capital was needed for developing the sector. Thus, it granted concessions to large-scale mining firms, in particular to East African Goldfields Limited. This created tensions, as alluvial settler-miners "felt that … the state was effectively excluding them from working alluvial deposits in the concession area" (Lemelle, 1986, pp. 152–153). These developments again underline the contradictions within, and the non-monolithic nature of, the British colonial state.

Disciplining, but also mobilising, local labour was attempted in different ways by the British. On the one hand, they adopted measures that had been established during German rule; for example, in 1923, again struggling with a labour shortage, they reintroduced the poll tax, which had been abolished after Germany's defeat in WWI (Lemelle, 1986). Through taxation, yet in a very localised way, they sought to integrate Tanzanians into the cash economy (A. Roberts, 1986). A further aim of the tax was to purposefully destroy pre-colonial forms of labour organisation to incentivise Africans to engage in waged labour. Note the similarity to the previously discussed German aims. On the other hand, the British adopted measures that, on paper, strengthened African workers' rights. These included a shift towards pro-digger legislation in the 1920s culminating in the 1929 Mining Ordinance, regarding the enforcement of legislation, provision of medical infrastructure for diggers and labourers, and labour and mine inspections (Kaijage, 1983a). Understanding the logic of a dual aim of increasing the labour supply while satisfying workers necessitates a discussion of the motives and the nature of the British colonial state.

For Berman and Lonsdale (1980), the colonial state had two, contradictory, demands: on the one hand, providing the institutional framework to create and to reproduce capitalist production relations by ensuring a stable supply of workers; and, on the other hand, to control and legitimise the status quo of property distribution and production relations by applying not only coercive but also "ideological and didactic" measures (p. 58) with the aim of intervening to minimise social discontent. According

to this ‘instrumentalist’ view, the colonial state acts as an agent of large capital located in metropolises in the Global North. Yet, the instrumentalist view falls short of analysing the agency in the colonial apparatus. We have seen that Lemelle (1986) contends that even though internal and external pressures from capital were shaping Tanganyika’s gold mining industry, the British colonial state was able to manoeuvre power within this situation. According to his reading, the state itself is the “arena” where struggle occurs at the “political, ideological and economic level” (p. 396). In this struggle, powerful individuals with very different interests tried their best to influence state policies, underlining the state’s “non-monolithic and contradictory” (p. 396) nature.

Three layers of tensions characterised the British colonial state (Kaijage, 1983a; Lemelle, 1986). First, the tensions between the central and provincial administrative apparatus which had to serve contradictory outside interests. For the former this meant satisfying the interests of British politicians and investors at home while the latter had to appease local white settlers and European businessmen (Kaijage, 1983a). Second, the different interests of actors embedded in colonial departments – such as the Mining Department’s medical and labour officers – prevailed. This conflict can be exemplified by the aim of the Mining Department’s labour officers to achieve highly profitable operations and the medical and labour officers’ concerns about the low quality of food and the treatment of sick labourers (Kaijage, 1983a). Third, personal and ideological convictions of individuals within the state led to advocating distinct policies (Kaijage, 1983a). This can be exemplified by the contrasting positions of “liberals and conservatives” (Kaijage, 1983a, p. 17) such as the Commissioner of Mines and the Director of the Geological Survey Department and the positions they adopted on whether to favour large mining capital or settler and small-miners interests.

Even though gold became an important export in the second half of the 1930s, the British colonial state refrained from becoming actively involved. Mining employed at least 10% of the national labour force in 1936 and during the 1930s approximately 14 tons of gold was mined (Elbra, 2017; A. Roberts, 1986). Between 1930 and 1934, gold accounted on average for 6.4% of exports and the figure rose to 14.1% between 1935 and 1939. One reason for this surge in output was the increasing dispersion of mining across the country as well as increased activities in both small and large mining (A. Roberts, 1986). Gold production peaked in 1940, when it accounted for 90% of the value of all produced minerals (Lange, 2006) and for almost 25% of total exports

(Lemelle, 1986). Nevertheless, the British colonial state was reluctant to engage more thoroughly in recruiting labour, and in providing direct economic support to the mining sector, for two reasons. First, it had profited little from sectoral revenues, as royalties and fees were low and, second, the gold price remained low. Thus, British economic plans were centred around augmenting the production of cotton (Chachage, 1995).

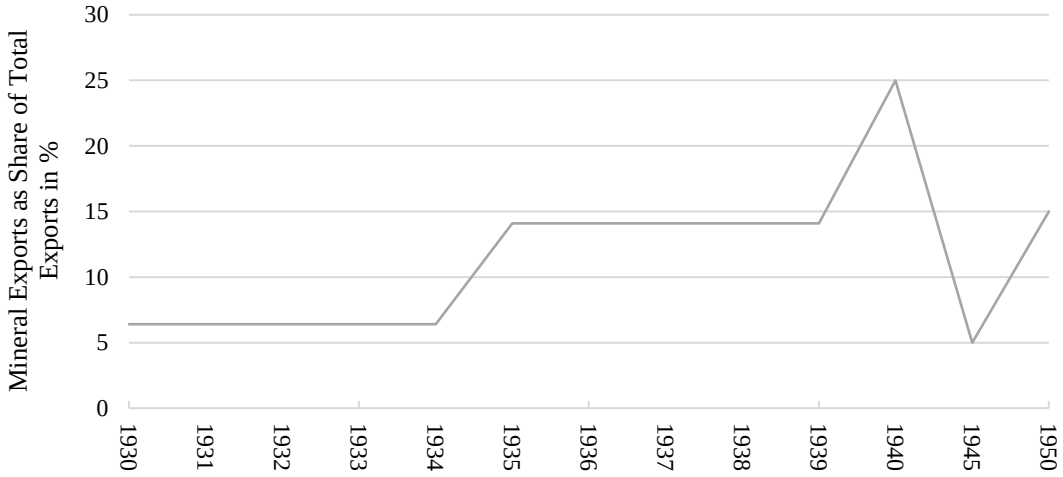
In the 1940s and 1950s, two major contrasting trends in mineral production emerged. Given the needs of the British (post-)war economy, particularly as a result of Lend-Lease, mining companies were denied priority for machinery supplies and gold prospecting was banned until the end of the war (Kulindwa et al., 2003; Westcott, 1982).[95] Thus, gold output slumped. Most large gold mines closed during the 1940s (Chachage, 1995) and, in 1945, gold accounted for only for 5% of the country's total exports (A. Roberts, 1986). Moreover, the price of gold remained fixed at the relatively low rate of US$35 from 1934 until 1968 and, thus, was not attractive to develop LSGM (Chachage, 1995). At the same time, the discovery of large diamond deposits in Shinyanga in 1940 and the subsequent launch of the Williamson Diamond mine led to a large increase in revenues stemming from diamond mining (Lange, 2006). By 1950, minerals accounted for 15% of the country's overall exports, contributing a record high of 3% to its GDP (Chachage, 1995). By 1960, two-thirds of mineral exports were diamonds, which indicates, given that gold exports were again slightly on the rise, that the relative share of diamonds in mineral exports must have been even higher (Chachage, 1995). The changing levels of mineral exports between 1930 and 1950 are summarised in Figure 5.2.

The increase in mineral production changed the sector's landscape. The only remaining working large-scale gold mine was Geita (owned by *Tanganyika Concessions*) which, until its closure in 1964, remained the largest gold mine in East Africa, employing some 2,200 people (Chachage, 1995). Yet, a number of medium-sized mining companies operated during the 1950s around Lupa (Saza and Ntumbi), Mpanda (Mukwamba), Mwanza (Geita and Mawe Meru), Musoma (Buhemba and Kiabakari), Singida (Sekenke-Iramba), Shinyanga (Nzega) and Ruvu River (Chachage, 1995). Small-scale mining, which had significantly increased during the 1930s, was

[95] The Lend-Lease agreement reduced the British need for gold, as exports became less relevant to Britain's position in international trade (A. Roberts, 1986). Lend-Lease described the agreement that the US would supply its allies with food and materials in the Second World War.

Figure 5.2

Mineral Exports During British Colonial Rule, 1930–1950



Note. For the years 1930-1934 and 1935-1939 only average values were found. Disaggregating by types of minerals was unfortunately not possible.

still in place and, given the decline of large-scale operations, had become a holding centre for miners and diggers formerly employed by large mines (Chachage, 1995).

To summarise, there was a marked degree of continuity in the views and policies of the German and British colonial states towards mining. Three key points have emerged. First, the colonial state controlled the land and distributed it at its discretion, completely disregarding pre-existing forms of customary land governance. Second, the Germans and the British resorted to taxation and coercion to create the labour supply for export cash crops, but also for mining. However, each colonial state was unable to solve the problem of an insufficient supply of labour. Both colonial states abstained from active infrastructure commitments to mining and, particularly during the British period, conflicts within the state of how to develop the mining industry emerged. Finally, both artisanal and reef mining remained of secondary political and thus economic importance compared to cash crop agriculture.

5.2 A Nationalised Mining Sector Under Julius Nyerere

In December 1961, Tanganyika gained independence, and after the Zanzibar Revolution, mainland Tanganyika and Zanzibar formed the United Republic of Tanzania (URT) in October 1964. The ruling party, the Tanganyika National Union (TANU), had emerged in a single-party system led by the charismatic Julius Nyerere, who became the young country's first president. He and his party envisioned a distinct

form of African socialism called *Ujamaa*.[96] Ujamaa, which means family in Swahili, was based on the ideal of traditional African village life with a focus on equality and cooperation (Gray, 2012).

Even though Tanzania aimed to remain non-aligned during the Cold War, a number of foreign policy tensions occurred from 1964 to 1966. These included: the British reluctance to recognise the validity of the liberation struggles in Southern Rhodesia (today's Zimbabwe); West Germany's threats to withdraw all forms of aid to the URT, as the Zanzibari revolutionary government had been first recognised by the German Democratic Republic; and the US and Belgian intervention in the Congo in favour of Moise Tshombe (Pratt, 1976). These developments nurtured Nyerere's scepticism of relying on major Western donors, leading to a shift in Tanzania's foreign policy and development strategy (Pratt, 1976).

In the following years, Tanzania embarked on a socialist development path and nationalised key parts of its economy. In 1967, Nyerere signed the Arusha Declaration outlining a pan-African Socialism for Tanzania which introduced Ujamaa: self-reliance and collective production, i.e. public control of major means of the economy and equal opportunity (Pratt, 1976). From 1967 the 'commanding heights' – e.g. private banks, the transportation sector, mining, and insurance services – were nationalised (Kulindwa et al., 2003; Pratt, 1976). Self-reliance vis-à-vis the Global North became a centrepiece of Nyerere's politics. This self-reliance translated into Nyerere's view that it would be better to leave the country's natural resources in the ground until the domestic technical capacities existed to manage mineral extraction independently (Lange & Kinyondo, 2016). He wanted "control of the economy by … indigenous people rather than by expatriates and others non-African in origin" (McHenry, 1994, p. 107).

As part of this state-led development path, the government became involved in the rights to land and minerals. The 1969 Mining Ordinance equipped the Department of Mines with the right to distribute and to decline prospecting licences – depending on whether the operation served the public or not (Chachage, 1995). Most mines were nationalised and, in 1972, a state-owned mining company (STAMICO) was set up (Bryceson et al., 2012). Moreover, the 1967 Land Acquisition Act allowed the government to acquire land for public purposes, transforming private into commercial

[96] The TANU and the Zanzibari Afro-Shirazi Party merged and became the Chama cha Mapunduzi, the Party of the Revolution, in 1977 (Coulson, 2013).

land (URT, 1967). Not only did the Act empower the government to take land on very short notice of six weeks, compensation was only paid for *improvements* made to the land but not for the land itself (Pedersen et al., 2016). This exposed smallholders to expropriation without compensation and customary land could be taken as wished, thus resembling colonial land legislation (Pedersen et al., 2016).

The nationalisation of the mining industry, combined with Nyerere's preference to leave minerals underground until domestic capacities existed, rendered mining economically irrelevant in the 1960s and 1970s. In the early 1960s, mining contributed only 3–4% of Tanzania's GDP (Kulindwa et al., 2003). Gold production slumped from three and a half tons in the mid-1960s to ten kilograms in the early 1970s (Bryceson et al., 2012). Adding to this, supplies to many large mines were affected by trade sanctions on South Africa from 1961 onwards (Chachage, 1995). With the closure of the Geita and Kiabakari mines from 1960 to 1966, large-scale mining became irrelevant and a pronounced structural shift to small-scale artisanal mining occurred (Bryceson et al., 2012; Lange, 2006). Despite the fact that small amounts of gold were continuously smuggled across the Kenyan border, 1971 marked the final year of official Tanzanian gold exports (Jones, 1983).

As Tanzania's nationalised mining sector was unable to profit from the growing global gold demand, small-scale miners partially picked up production. As highlighted previously, the global gold price remained fixed at US$35 per ounce until 1968, rendering large capital investments in mining unattractive; however, from 1968 onwards, this fixed price came under market pressure and in 1975 a flexible exchange rate was introduced (Cooksey & Kelsall, 2011). Yet, STAMICO was unsuccessful in increasing gold output because of insufficient technology and capital levels as well as lack of professional knowledge (Dreschler, 2001). Artisanal miners filled this gap and easily sourced with rudimentary tools marketable minerals such as gemstones and gold (Bryceson et al., 2012; Dreschler, 2001). In the late 1970s, small-scale mines were scattered all over the country providing employment to 10,000–50,000 workers (Bryceson et al., 2012).

Small mining activities in the 1960s and 1970s were neither officially recognised nor recorded with the produce often smuggled out of the country, mainly to Kenya without any tax revenues (Bryceson et al., 2012; Dreschler, 2001). Gold smuggling became a major problem which cost the Tanzanian state large sums of tax revenues. These high levels of illegal trade are evident when looking at the substantial

increases in reported gold exports in the late 1980s after the end of STAMICO's monopoly on producing minerals (Bryceson et al., 2012). In the early 1990s, mineral smuggling was still rampant. For 1992 it is estimated that only one quarter of Tanzania's domestically sourced gold was traded legally while around 80% of gemstones were smuggled out of the country (Chachage, 1995). As ASM activities continued to be unrecorded, capturing ASM rents through taxation seems to have been of minor importance in Nyerere's political agenda.

Not only the parallel economy but also broader political developments harmed the politics of Ujamaa during the 1970s. Between 1975 and 1981, the third five-year plan focused on state-led investment financed through foreign aid (Wuyts & Kilama, 2014). Tanzania's agricultural strategy was now based on processing agricultural products prior to exportation (Coulson, 2013). Moreover, one part of the Ujamaa, the villagisation programme – the idea to move peasants into new communal villages – faced resistance, as commutes were longer and plots less fertile (Edwards, 2012). The villagisation programme, combined with the droughts of 1973–1974, led not only to severe shortages of rice and wheat flour but also of imports, as the country's terms of trade deteriorated (Edwards, 2012). Moreover, a basic industry strategy was missing in the short term. Although the scope of this thesis prevents venturing in depth into the question of why TANU's strategy failed, it should be acknowledged that the actions of the state from 1967 onwards went hand-in-hand with capital inflows of foreign aid (Coulson, 2013).

The 1979 Mining Act can be read as a slight readjustment of the mining sector development strategy. Revoking the 1929 Ordinance, the government pursued a dual strategy of attracting large capital investors whilst also acknowledging artisanal operations (Chachage, 1995). Even though ownership of minerals remained vested in the state, the understanding that only the government was allowed to pursue exploration and mining was abandoned (Kulindwa et al., 2003). A "gradual withdrawal of the state's direct engagement" occurred, yet the discretionary power of the Minister for Mineral Affairs remained high (Pedersen et al., 2016, p. 15).

According to the 1979 Act, applications for prospecting and mining claims ought to be in "the public interest" (URT, 1979, sec. 39:2(i)). Yet, nowhere was "public interest" explicitly defined (Butler, 2004, p. 73). The minister could further approve or suspend a licence conditionally or unconditionally, had the right to visit mining sites, and could demand sight of company documents (Butler, 2004). The 1979 Act also

acknowledged ASM activities by allowing Tanzanians to gain prospecting and mining rights. A policy paper on small-scale mining followed in 1983 to stimulate ASM as an auxiliary to rural income activities (Chachage, 1995). At the same time, large mining operations were allowed to operate as joint ventures with state mining companies but not to hold mining concessions (Jønsson & Fold, 2009; Society for International Development, 2009). The 1979 Act combined with the 1983 policy paper built a first formal framework for ASM and LSM after independence (Bryceson et al., 2012; Jønsson & Fold, 2009).

Even though access to land and minerals was controlled by the government, the question of customary rights remained unanswered. How customary land rights were protected against, and could coexist with, private investment remained unsolved (Pedersen et al., 2016). This was problematic, as most rural Tanzanians still relied on customary land rights (Lange, 2011). Although the 1979 Mining Act boosted artisanal mining, it failed to strengthen customary land rights vis-à-vis formal land titles (Bryceson et al., 2012; Pedersen et al., 2016). The unsolved question of whose land rights matter regained relevance during the 1990s and 2000s, when conflicts over land rights between foreign large mining operations and Tanzania's ASM labour force unfolded.

To conclude, we have seen that after independence Tanzania embarked on a path of centralised and planned economic development. Nationalising the mining sector gave rise to two developments. On the one hand, production declined, as many large mines closed and STAMICO's output was negligible. On the other hand, small-scale mining activities became more common, as laid-off skilled mine workers began to work on their own. As discussed above, most of the produce was smuggled out of the country resulting in negligible government revenues. A reversal of mining policies occurred with the 1979 Mining Act which both provided the base for joint large-scale investments of private investors and the state, and legally recognised and designated specific areas for artisanal and small-scale mining.

5.3 The Liberalisation of Tanzania's Mining Codes

We have seen that during the second half of the 1970s, the politics of Ujamaa experienced more and more headwind while the 1979 Mining Act was a first deviation from a state-led development path. Pressure intensified in the early 1980s, as the

country experienced external shocks including rising oil prices, falling export crops prices, and a budget squeeze due to the costly war with Uganda (Wuyts, 1994). At the same time, Tanzania's strategy of accumulation through aid-financed agricultural exports stalled, as from 1980 onwards bilateral development aid reduced dramatically (Wangwe, 2004; Wuyts, 1994). Adding to this, the country had to repay debt to its international donors (Gray, 2012). In an environment of a flourishing parallel economy, in which only the affluent could afford certain goods, an economic and political crisis unfolded.

The crisis led to paradigmatic change in Tanzanian politics. In November 1979, an International Monetary Fund (IMF) delegation recommended a currency devaluation which Nyerere refused. In the mid-1980s the country became more and more isolated, as the last Nordic countries ended their international financial aid (Edwards, 2012). In 1985, Nyerere announced that he would not stand for re-election. In 1986, the newly-elected president Ali Hassan Mwinyi signed a Stand-by Agreement with the IMF and a Structural Adjustment Program (SAP) with the World Bank (Gray, 2012). This meant that the market would allocate resources rather than the state, prices would be deregulated, subsidies and tariffs removed, and exchange rates floated (Gray, 2012). In the following years, trade and prices were liberalised, the exchange rate devalued, public expenditure cut, and parastatal crop authorities dissolved (Gray, 2012). In short, a rollback of the state occurred and a market-led development path was adopted.

This economic liberalisation also included pro-market practices concerning Tanzania's mining sector. Between 1987 and 1989, trade regulations on minerals were liberalised and private trade allowed. Moreover, the Bank of Tanzania (BoT) started to buy gold at world market prices with "no questions asked" (Chachage, 1995, pp. 54–55). Mwinyi's government also entered into several bilateral agreements with private-sector mining companies: these Mining Development Agreements (MDAs) offered lucrative terms for investors such as tax waivers on imported goods and fuel, provisions for standard rate income and payroll tax, and tax write-offs for capital expenditures for the year in which capital was acquired (Cooksey & Kelsall, 2011). Perhaps most importantly, MDAs remained mainly undisclosed to the public (Nyankweli, 2012).

These practices soon translated into tangible policies. MDAs were consolidated in the form of a new mineral sector policy proposed in 1997 and implemented one year later as the 1998 Mining Act under President Benjamin Mkapa (Lange, 2011). A previous Technical Assistance Project by the World Bank had already introduced an

"appropriate legal, regulatory and fiscal regime", laying the ground for a "uniform, competitive and stable" investment environment (World Bank, 1994, p. 7). Moreover, the World Bank played an active role in the 1997 National Investment Act and the 1999 Mining Regulations (Bryceson et al., 2012).

The shape of these policy reforms, most importantly the 1998 Mining Code, were influenced by IFIs and foreign investors. Both the 1998 Mining Act and the 1997 Investment Act were part of the above-mentioned five-year World Bank Technical Assistance Project at a time when Tanzania needed to qualify for the Bank's debt relief scheme for Highly Indebted Poor Countries (HIPC) (Butler, 2004; World Bank, 1994). HIPC relief schemes are conditioned on a country's economic liberalisation targeting market- and export-led development.[97] World Bank member countries with strong national corporate interests in mining had vested interests in influencing policy reform outcomes accordingly (Butler, 2004). Two examples illustrate how the private sector and the political realm intertwined. Senior officials of Sutton, a large Canadian mining firm, and the Canadian High Commissioner to Tanzania attended a policy conference in Arusha in 1996 when a draft of the 1998 Act was discussed (Butler, 2004). Moreover, a British law firm, Transborder Associates, specialising in "privatizing and liberalizing developing economies", was commissioned to draft the 1998 Mining Act (Emel et al., 2011, p. 76). This underlines the strong influence of private sector interests in the formation of Tanzania's 1998 Mining Act and the Tanzanian government's limited leverage (Lissu, 2001).

The 1998 Mining Act reflected these vested interests of large mining companies. Royalties were guaranteed and pegged at 3%, import duties waived, and tax exemptions on imported supplies granted (Cooksey & Kelsall, 2011; URT, 1998, sec. 86:1b, 10:2a). In contrast to other mineral-rich economies such as Ghana, ownership restrictions were fully lifted (Cooksey & Kelsall, 2011) and guarantees against nationalisation and expropriation were given (URT, 1998, sec. 109). Moreover, the 1997 Investment Act created a tax loophole allowing mining companies to roll over "unredeemed capital expenditures" for years (URT, 1997a, sec. 18). Consequently, the government missed out on millions of dollars in revenues (Cooksey & Kelsall, 2011).[98] The Act's orientation towards the private sector also affected the government's role.

[97] In reality, economic liberalisation in Tanzania did not trigger an export boom (Wuyts & Kilama, 2014).
[98] The story of how this clause entered the 1998 Mining Act is vividly described by Cooksey and Kelsall (2011).

The 1998 Act curtailed the government's role to a service-provider, limiting its discretionary power. While the 1979 Mining Act had conceptualised the state as "owner and operator" of mining activities, the World Bank envisioned a paradigmatic shift to a lean government as a "regulator, promoter and service-provider" (Nyankweli, 2012, p. 53). In this sense, the aim was to strengthen capacities to register and monitor exploration and mining licences (Bourgouin, 2011). In effect, the state took on a purely passive role, creating an 'enabling environment' for private sector activities and weakening the discretionary power of the Ministry of Minerals (Butler, 2004). Two changes in particular exemplify this. First, the 1979 Mining Act allowed the Minister to refuse MDAs if they did not serve the public interest whereas the 1998 Mining Act limited their discretionary power (URT, 1998, sec. 10:2b, 10:3) and rendered ministerial decisions accountable to a newly-created Mining Advisory Committee (URT, 1998, sec. 20:4).[99] A second change concerned special mining licences (SML) – required for the most capital-intense mining operations. The 1998 Act limited the minister's discretionary power to refuse approval of SMLs, specifically when the applicant had yet to gain either a prospecting or retention licence (Butler, 2004; URT, 1998, sec. 40b). The 1998 Act also limited the grounds for rejecting an amendment of a company's terms of an MDA (URT, 1998, sec. 45:1).

Given these specific changes, the 1998 Act was primarily directed towards the interests of large investors while the Code's sections on small-scale mining mirrored this liberalisation. The Act strengthened the rights of PMLs which are exclusive to ASM activities. Despite PMLs being restricted to Tanzanian citizens, they could now be "assigned to another person without the consent … of the licensing authority" (URT, 1998, sec. 9:2) and used as a collateral and transferred to financial institutions without the consent of the minister (URT, 1998, sec. 9:3b).

Liberalisation increased output and revenues of LSM significantly over time. New mineral discoveries led the government to issue eight reconnaissance, 75 prospecting licences, and 17 mining licences between 1989 and 1992 (Bryceson et al., 2012; Chachage, 1995).[100] In 1991 alone, mineral sales increased by almost 70%

[99] The committee consisted of the chairmen, appointed by the president, one representative from the Ministry of Industries and Trade, and six others. Of these six, two were appointed by the Minister of Minerals; one by the Minister of Finance; one by the Minister for environmental protection; one by the Minister responsible for lands; and one by the Attorney General (URT, 1998).

[100] The licences covered not only gold but also a range of precious minerals and metals, including nickel, cobalt, diamonds, graphite, gemstones, bauxite, beach sands, etc. (Chachage, 1995).

(Lange, 2006) while in 1992, Tanzania's officially exported gold rose from quasi-zero to four and a half tons (Kulindwa et al., 2003). In the late 1990s and 2000s, large-scale mining took off, as various mineral rushes occurred across the country (Bryceson et al., 2012). Between 1998 and 2003 six large-scale mines were established, more than 20 exploration companies were active in the country (Emel et al., 2011; Lange, 2011), and mineral exports increased from less than 1% of total exports in the late 1990s to 50% in 2005 (World Bank, 2006). From 1998 until 2014, Tanzania's mining sector underwent its "biggest boom in mining capital investment in its history" (Emel et al., 2011, p. 76) and attracted more than US$2.5 billion of foreign direct investments (Bryceson et al., 2012). Multinational mining companies – attracted by a favourable investment climate – now took on a dominant role in Tanzania's mining sector (Elbra, 2017).

At the same time, Tanzania's small-scale mining population grew substantially. Structural adjustment policies from the late 1980s onwards had detrimental effects on rural households, as agricultural subsidies were removed, marketing boards dismantled, and user fees for education and public services introduced (Bryceson et al., 2012). This, combined with low commodity prices, led to a search for alternatives to agriculture and to labour migrating into ASM activities (Bryceson et al., 2012). Small-scale mining activities increased and it is estimated that in the mid-1990s between 450,000 and 600,000 Tanzanians were directly involved in the sector (ILO, 1999). Thus, the liberalised mining codes of the late 1990s went along with growth in the ASM sector and large mining operations (Bryceson et al., 2012; Emel & Huber, 2008).

However, the investor-friendly mining reforms under Mkapa and the effects of the mining boom instigated a controversial debate about the beneficiaries of mineral extraction. Despite the strong growth performance of its LSM sector, the Tanzanian state accrued limited tax revenues, as royalties were low and very little, if any, of the sectoral revenues were reinvested in the country (Jacob et al., 2016; Poncian & George, 2015). A report by Curtis and Lissu (2008) found that large-scale mining companies were incorrectly declaring losses in order to minimise their corporate tax liabilities which led to public outrage that Tanzania's population was being short-changed. Large-scale mining companies were also accused of non-transparent tax payments (Cooksey & Kelsall, 2011). MDAs, in particular, were subject to rising criticism due to their secrecy, air and water pollution in local communities, and unpaid taxes (Policy Forum, 2010).

As designated mining lands were often the sites of customary land practices, clearances constituted a major source of conflict. Land cultivated by farmers and grazed by pastoralists, was 'cleared' for LSM and only in a few cases was compensation paid (Cooksey & Kelsall, 2011). Likewise, the clearing of thousands of small-scale mines in the early 1990s for LSM was highly controversial, as the conflict around the Bulyanhulu mine in Shinyanga, discussed next, illustrates (Cooksey & Kelsall, 2011).

5.3.1 Bulyanhulu: Displacement, Violence, and Government Manoeuvring

From the mid-1970s, the gold deposits in the Bulyanhulu area in northwest Tanzania formed one of the country's largest small-scale mining areas (Chachage, 1995). In the early 1990s, as more deposits were discovered, a mineral rush led to an influx of between 30,000 to 400,000 miners to the area (BGC and KMCL, 1999, as cited in Lissu, 2001). The interests of foreign mining companies and ASM workers in Bulyanhulu soon became a site of conflict over gold mining rights. Examining the interests of the actors involved helps to obtain an understanding of (i) how shifting power balances affect policy frameworks and (ii) the non-monolithic nature of the government.

In 1989, Placer Dome, a Canadian mining company, and Dar Tardine, its Tanzanian partner, obtained a prospecting licence for the region; this was revoked in 1992, as the company was accused of smuggling gold (Cooksey & Kelsall, 2011). In February 1993, President Ali Hassan Mwinyi visited Bulyanhulu and granted local miners the right to mine gold in the area on condition that they sold their gold to the government (Cooksey & Kelsall, 2011). Yet, in August 1994, Sutton Resources, another Canadian large-scale mining company, signed a MDA through Kahama Mining Company Ltd., its local subsidiary (Cooksey & Kelsall, 2011) with the Minister of Water, Energy and Minerals, Jakaya Kikwete. This begs the question of the motives behind this wavering course.

Contradictory positions regarding the role of ASM had emerged within the Mwinyi government. Originally, the focus was set on accruing rents from small-scale mining but in practice contrasting interests emerged (Cooksey & Kelsall, 2011). On the one hand, in October 1993, forces in the Ministry of Water, Energy and Minerals ignored applications by small miners for prospecting and mining licences in Bulyanhulu (Cooksey, 2011; Cooksey & Kelsall, 2011). The group instead supported

large foreign investments, hoping to accrue its own rent shares from these deals (Cooksey & Kelsall, 2011). It was Jakaya Kikwete himself, who would then become the subsequent Tanzanian president in 2005, who signed the MDA with Sutton (Cooksey, 2011) On the other hand, central government representatives at the regional level, in Shinyanga and Kahama, hesitated to side with the Canadian investors (Cooksey, 2011). The district commissioner for Kahama District, for instance, wrote to Kikwete to lament the case of "over 300,000 people in the area that were now supposed to be evicted. These people are earning a living as well as contributing to the national economy" (Cooksey, 2011, p. 25).

The conflict between small miners and Sutton Resources at Bulyanhulu intensified and escalated from 1995 to 1996. Sutton filed a court case in June 1995 asking that the miners be evicted, but in September the same year, Tanzania's High Court ruled in their favour (Cooksey, 2011). However, the pro-ASM faction lost power after the 1995 elections and in early 1996, Mkapa's government decided to side with Sutton over the local miners. In July 1996, William Shija, then Minister of Energy and Minerals, demanded local miners vacate the area within one month. Evictions began in early August despite a call by the High Court to stop the exercise because the lawsuit was still in court (Cooksey, 2011). In early August 1996, evictions, and resistance to them, led to eleven casualties according to the government, while ASM representatives claimed a death toll of 54 (Cooksey, 2011).

The positioning of Benjamin Mkapa requires further scrutiny. In the run-up to Tanzania's first multiparty elections in July 1995, the government, in the person of Prime Minister Cleopa Msuya acknowledged "the importance of both the small-scale and large-scale miner" (Cooksey & Kelsall, 2011, p. 74). Yet, a week prior to the elections, a press release was issued ascertaining that the CCM's candidate, Mkapa, would back the interests of ASM at Bulyanhulu (Cooksey & Kelsall, 2011). Shortly after winning the elections in December 1995, Mkapa backpeddled and instead aligned his government with the interests of foreign capital and donors (Cooksey & Kelsall, 2011). Thus, Bulyanhulu can be seen as a turning point toward foreign dominance as Tanzania's government embraced LSM over ASM interests (Cooksey & Kelsall, 2011).

Situating the conflict of Bulyanhulu in the larger picture helps to explain its effects on the wider political economy. The conflict over resource sovereignty not only led to a strengthening of investor interests vis-à-vis the government, but also affected the power relationships between the central government, the Ministry for Water, Energy

and Minerals, local politicians, and ordinary Tanzanians (Lange, 2011). While, under Mwinyi the ASM sector had been identified as a source of mineral rents for the Tanzanian state, under Mkapa's term the government's focus on capturing rents shifted towards LSM. This might be explained by the fact that ASM activities were hardly formalised and thus difficult to capture by the state. The rent-seeking interests with respect to LSM of powerful individuals within the government can help to explain how policy approaches towards the sector varied. The next section builds on this point by discussing the motives behind the mineral policies of the 2000s and 2010s.

5.4 Kikwete's Turn Towards a Dual LSM Strategy

Against the backdrop of public tension with regard to the benefits of LSM, Jakaya Kikwete's presidency (2005-2015) was characterised by a turn towards restoring Tanzania's sovereignty over its resources. On the one hand, public criticism of the private sector-friendly nature of mining codes, and how the resultant small contribution of gold mining to the country's economy in the early 2000s, led to the commissioning of three reports reviewing the mining sector (Jacob et al., 2016). The most notable, by the Bomani Commission, released in 2008, recommended reviewing taxation practices and demanding a larger share of revenues from large-scale mining companies.[101] On the other hand, Kikwete's administration continually welcomed LSM, aiming to raise the contribution of mining to the country's GDP to 10% by 2025 (URT, 1997b). This dual strategy, combined with continuous public dissatisfaction, led to a new mining framework: the 2010 Mining Act.

On the one hand, the 2010 Act strengthened the power of the state in relation to large investors. This legal change reversed the liberalisation efforts of the 1998 Act and called for the state's active involvement in large mining (URT, 2010, sec. 10:2) as exemplified by the changed approach towards MDAs. A model MDA for all new mining agreements larger than US$100 million was established and the government automatically owned an equity stake in future MDAs (Emel et al., 2011; URT, 2010, sec. 112:f). The Ministry became a stronger regulator, not only in the form of issuing licences but also by certifying to investors' the safety of their investments (Jacob et al., 2016). Further aspects in bringing the state back in were the creation of the National Development Corporation (NDC), the most important parastatal, and the strengthening

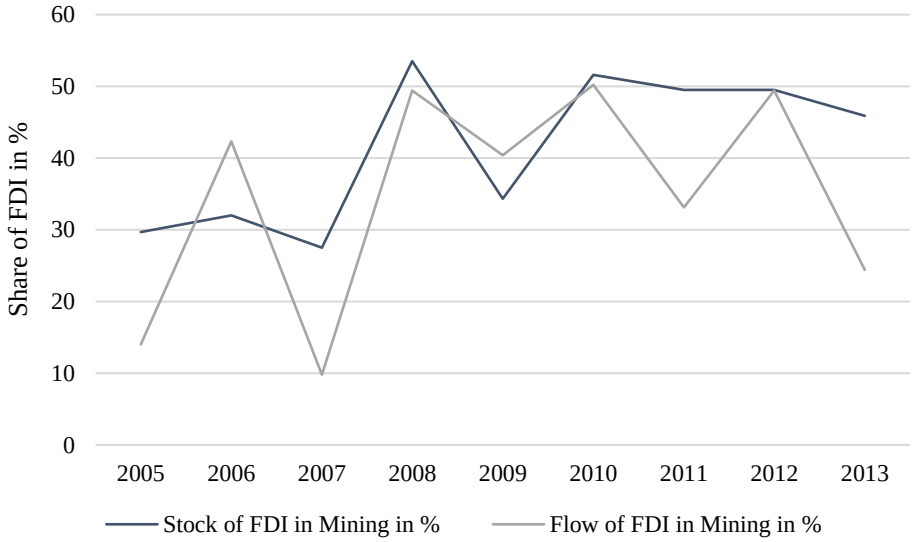
[101] Named after its leading judge, Mark Bomani.

of the national mining company STAMICO (Edwards, 2012). STAMICO took over the Buhemba gold mine and was given 45% of the Buck Reef gold mine (Jacob et al., 2016). Further changes included a higher royalty of 4% for gold, now based on the gross value of minerals (URT, 2010, sec. 87:1). Moreover, the 2010 Act demanded a greater degree of transparency and disclosure from mining claim holders. Large-scale mining companies operating in Tanzania now had to be listed on the local stock exchange and a certain percentage of their output had to be processed in Tanzania (URT, 2010, secs. 59, 100, 109).

On the other hand, despite the fact that the 2010 Act strengthened the government's position versus LSM companies, mineral rents and FDI in the sector reached a record high. As highlighted by Andreoni (2017a), from 2004 to 2015 Tanzania's mineral rents remained above 1% of GDP and recorded a high of 5% of GDP in 2011.[102] These numbers are significantly higher than the rents accrued by neighbouring countries such as Burundi, Rwanda, Kenya, and Ethiopia, who all reported relative shares of less than 1% of GDP during the same time period (Andreoni, 2017a). Moreover, as highlighted in Figure 5.3, FDI stocks and flows to the mining sector remained high during Kikwete's presidency. From 2005 until 2013, an average of 41.5% of the total FDI stocks were in mining, the largest of any economic activity.

Figure 5.3

FDI in the Mining Sector During Kikwete's Presidency, 2005–2015



Note. Source: Tanzania Investment Report, URT, 2014b.

[102] Andreoni (2017a) calculated mineral rents by considering "the difference between the value of production for a stock of minerals at world prices and their total costs of production" (p. 15)

Likewise, during the same time period, 34.8% of FDI flew into the sector.

Even though the 2010 Act strengthened the state's position vis-à-vis large mining, it did not reflect the empirical reality of Tanzania's ASM sector. Two examples help to illustrate this point. First, consistent with the 1998 Act, the 2010 framework covers ASM under "primary mining licenses", thus covering operations with less than US$100,000 of capital investment (URT, 2010, sec. 4:1). This investment limit was further raised in 2015 to US$5 million (URT, 2015, sec. 29b). We have seen that ASM is mainly driven by rural poverty and that the vast majority of individuals engage in the sector informally. Subsuming these individuals under one PML, thus equating "small-scale mining with primary license holders" (Merket, 2019, p. 15) neither reflected the heterogeneity of the capital levels nor of the individuals engaged in the sector. This failure to acknowledge the heterogeneity in the sector restricted the ways in which it could be targeted, not only by formalisation efforts but also by poverty reduction schemes. The investment limit of US$5 million symbolically reflects the distance between the economic reality faced by the weakest ASM miners and the government policy on ASM.

Second, the 2010 Act does not address organisational ASM practices and paid employment remained uncovered. While the 1998 Mining Act considered people working for others on a PML area as "employees" (URT, 1998), the 2010 Act describes this group as "servants and agents" (URT, 2010, sec. 55:3). Yet, both descriptions fail to specify the rights and duties of the individuals who informally sub-lease a PML and run a pit's operation – the pit managers – and of the mining and processing workers employed. Thus, the practice of casual labour and subleases remained unregulated. Even though the 2010 Act acknowledges ASM activities, it did not entail a more strategic approach – grounded in the empirical reality of ASM in Tanzania – to formalise ASM and to integrate it in an existing legal framework. Thus, a pronounced gap between existing mining codes and local ASM practices remained. This gap not only concerned local ASM practices but also the issue of land (Cooksey & Kelsall, 2011). Land and mining legislation therefore remained misaligned. One major reason was that mineral legislation overruled land legislation in case minerals were discovered (Jacob et al., 2016, p. 12; URT, 1999, sec. 4:4). Thus, the holder of the land title was only allowed to appeal about the level of compensation but not for the ownership of the land itself (Jacob et al., 2016).

The power to resist investment in mining from outside shifted away from local farmers and miners towards the central government with the 2010 Mining Act. The 1999 Land Act aimed to strengthen local control by recognising customary rights as equal to formal land rights and by shifting control and administration to the village level, as villagers were able to reject projects by investors and politicians (Pedersen et al., 2016). This changed with the 2010 Act, which allowed to resolve land disputes at the local level, but at the same time allowed the Mining Commissioner to "singlehandedly" administer land disputes on prospecting and mining land (Kinyondo & Huggins, 2019, p. 184). Moreover, even though land owners were compensated with the market value of their land and PML holders might receive compensations for displacements, pit owners or workers were not covered by the 2010 Act (Fisher, 2008). Again, this highlights that the heterogeneity of individuals involved in ASM was not reflected in the 2010 Act.

5.5 Magufuli's Mining Policies: Resource Sovereignty Regained – But What is In It for the Average ASM Worker?

After a historically competitive election, John Pombe Magufuli was sworn into office as the fifth president of the United Republic of Tanzania in November 2015. The early days of his presidency were marked by an anti-corruption strategy challenging not only the political but also the private sector establishment (Cheeseman, 2016; Paget, 2017a, 2017c). In so doing, Magufuli deployed a tactic which might be described as a new populism. On the one hand, he took highly visible measures to call out budget misallocations such as cancelling independence day celebrations and redirecting those funds to anti-cholera measures (The Citizen, 2015b) or launching a national audit to find 'ghost' public sector workers registered under a fake name to collect extra wages (The East African, 2016). To underline the rhetoric of fighting red tape in the government he made an unannounced visit to the Ministry of Finance (The Citizen, 2015a), telling workers "to work hard and be accountable on duty". Magufuli also took concrete measures, for example, by sacking the leaders of Tanzania's Ports Authority (The East African, 2015), replacing a substantial proportion of the staff of its revenue authorities (Ippmedia, 2016a), and by sacking almost 10,000 civil servants with fake certificates (Namkwahe, 2017). Magufuli's policy style, living up to his nickname of 'the Bulldozer', not only targeted the government but also large mining companies.

From 2016 onwards, the government intensified efforts to reclaim national sovereignty over the country's mineral wealth and domestic value creation. In August 2016, Magufuli banned coal imports to strengthen domestic production and improve Tanzania's trade deficit. Then, in early March 2017, the government imposed an export ban on unprocessed mineral ores. From March to April 2017, Acacia Mining, a subsidiary of Barrick Gold, the world's largest gold mining company, became the president's target. A presidential committee reported that Acacia's containers in the port of Dar es Salaam contained more than 14 times the amount of gold the company had officially reported. Acacia was accused of systematically under-reporting exported quantities of gold and was ordered to pay around US$190 billion in fines, interest, and revised taxes (Paget, 2017a, 2017b).[103] Magufuli also threatened to nationalise the mines concerned (The East African, 2017). The Acacia incident was resolved in mid-October 2017 when Barrick agreed to sell 16% of its stakes in the Bulyanhulu, Buzwagi and North Mara mines and to pay half of its annual revenues, plus an additional US$300 million to the Tanzanian Government (Githaiga, 2017).

These first moves trailblazed the mineral policy reforms consolidating the government's new position. In July 2017, the National Assembly passed three bills amending the 2010 Mining Act which had substantial implications for large-scale mining in the country.[104] These changes included an increase in royalty rates of two percentage points, up to 6% (URT, 2017b, sec. 23b) and the introduction of a clearing fee of 1% (URT, 2017a, sec. 90A:4). The amendments allowed the government to dissolve existing MDAs if the agreement was "prejudicial" to Tanzanian interests (URT, 2017c, sec. 5:3). With these changes, MDAs – long controversial for being hidden from public scrutiny until then – became revocable. According to the 2017 amendments, an agreement is "unconscionable" if it is "depriving the people of Tanzania of the economic benefits derived from subjecting natural wealth … to beneficiation in the country" (URT, 2017c, sec. 6:2g). Yet, it remains an open question as to the exact meaning of "economic benefits" and "prejudicial" as they are not defined anywhere in the Act. The government is further entitled to a 16% share of any mining company's

[103] According to the government, the extremely high amount results from under-reporting and from foregone tax revenues over the years (Forstater & Readhead, 2017; Paget, 2017b).

[104] The three laws were: The Natural Wealth and Resources (Permanent Sovereignty) Act, 2017; The Natural Wealth and Resources (Review and Re-Negotiation of Unconscionable Terms) Act, 2017; and The Written Laws (Miscellaneous Amendments) Act, 2017. All three were passed under a certificate of urgency, which highlights that the legislative process was much faster than for an ordinary bill (Jacob & Pedersen, 2018).

stock without compensation, and is empowered to acquire a further 34% up to a maximum of 50% (URT, 2017b, sec. 10). Moreover, international arbitration to resolve disputes was no longer permitted, earnings from the sector had to be banked locally, and minerals processed in Tanzania (URT, 2018, sec. 59). Lastly, the export ban on unprocessed ore from March 2017 was formalised as an act of law (URT, 2017b, sec. 25c).

While the 2017 amendments strengthened the government's discretionary power vis-à-vis large mining, Magufuli's administration also promoted ASM activities. In his inaugural speech, Magufuli remarked that "indigenous people [are] not benefitting" from mining and that he would take their requests for designated ASM areas, compensation, access to loans, and tax complaints seriously (TZ One, 2015). In 2016, the government disbursed around US$3 million to 111 PML holders to mechanise ASM operations (Mutagwaba et al., 2018). Yet, in August 2018, Minister of Minerals Angela Kairuki suspended the scheme because some grants had ended up in the hands of people who were not miners and the money was not spent on ASM activities (Nkwame, 2018). Moreover, in December 2016, Magufuli ordered the removal of the prospecting licence of a subsidiary of Acacia Mining in Shinyanga Region, allowing 5,000 ASM miners to access the fields (Ippmedia, 2016b).

Another area of government focus was the reduction of smuggling to increase its revenues. As noted above, smuggling had traditionally been a major impediment to higher government revenues from ASM. Repeatedly cited reasons are corruption as well as high taxes. In 2019, small-scale miners were subject to six annual taxes; 18% VAT, 6% royalty, 5% withholding tax, 1% inspection and clearance fee, and 0.3% municipal levy (Gerald, 2019). To lighten the fiscal pressure on them, in February 2019, the withholding tax was removed (The New Times, 2019). In the same year, as a further step to promote the formal trade of ASM gold, the government set up mineral trading centres (The Citizen, 2019a). These efforts showed results; ASM revenues increased from 0.33 tons, worth around TZS22.5 billion (US$9.7 million) in 2016, to 4.59 tons, worth around TZS375.5 billion (US$153 million), in 2019 (The Citizen, 2020a).

Yet Tanzania's mining codes continue to be misaligned to ASM's organisational practices on the ground. The 2010 Mining Act subsumed small formal mining under the catch-all category of the PML. Yet, as many empirical contributions concur, most formal Tanzanian PML holders do not develop their areas but lease them to individuals who *informally* work on the designated PML area (Merket, 2019;

Mutagwaba et al., 2018; Mwaipopo et al., 2004).[105] These individuals, the pit managers, are in charge of all operative tasks and hiring workers. In some cases hundreds of pit managers establish their pits informally under a single PML licence (Fisher, 2008). Earlier in this chapter we discussed that neither the 1998 nor the 2010 Act aligned mining codes to local ASM practices, even though policy makers were aware of these legal shortcomings (Fisher, 2007). The 2017 amendments maintain the 2010 wording of a PML holder's employees as "servants and agents" (URT, 2018, sec. 55:3) without engaging in the organisational aspects. They neither address nor formalise the practice of subleasing. In so doing, the 2017 amendments conform to the logic of former mining codes and neither provide a reliable legal ASM framework nor acknowledge its heterogeneous and poverty-driven nature (Kinyondo & Huggins, 2019).

The gap between ASM practices and the 2017 regulatory framework matters, as access to formal ASM remains troublesome for many individuals. As shown in Figure 5.4, the number of newly issued PMLs has been declining since 2015. In 2017, only 13% of PMLs were active (Mutagwaba et al., 2018). The government addressed the problem of inactive PMLs by cancelling 2081 of them from June 2016 to April 2017 (Mutagwaba et al., 2018) and further revoking 175 in October 2021 (Dominick, 2021). Nevertheless, to date, the costs of obtaining a PML remain relatively high; including its application, processing, travels, annual land rent and the licence renewal, it comes to around US$120 (Merket, 2019), roughly 1.5 times the average Tanzanian monthly income (World Bank, 2020a).[106]

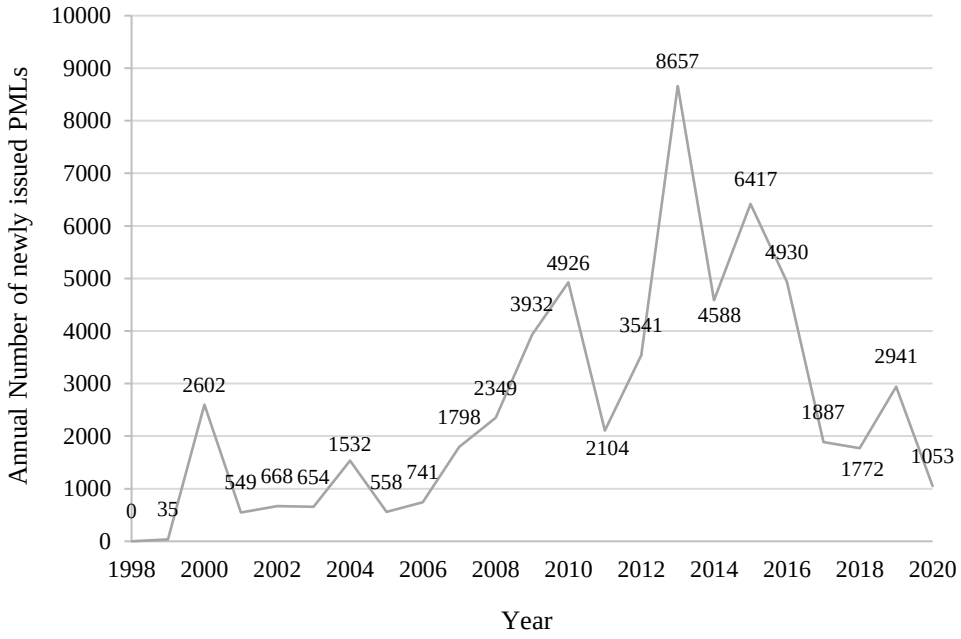
Moreover, PML applications are now made online via a Mining Cadastre Transactional Portal, which currently (2021) is only available in English ("Tanzania Mining Cadastre Portal - Home - FlexiCadastre," n.d.). Even though this is argued to foster remote applications, it might advantage individuals with close ties to politics and to the ministry, who can then strike quickly in case of a mineral rush (Merket, 2019).

[105] PML subleasing originally dates back to the 1970s when large Tanzanian mining companies, such as Dar Tardine, sub-contracted small miners to "organise [..] production and labour processes" (Chachage, 1995, p. 76). Thus, formal and informal practices were intertwined.

[106] The average monthly income per capita was US$82.1 in 2019 at constant 2010 US$ (World Bank, 2020a).

Figure 5.4

Number of Primary Mining Licences Issued, 1998–2020



Note. Mining Commission, https://tumemadini.go.tz/uploads/files/Mining%20Licences%20Information1.pdf, Accessed 03-02-2021.

One interviewed sectoral expert summarised this contrast:

> I find it difficult how a normal miner in a remote area in Tanzania can access a mining cadastre system … But I wouldn't say that it's not helping because I do see people who can assist small-scale miners in remote areas; so, everybody may not be able to do it, but still, a few who can, can assist doing it that way rather than travelling from the mining areas … to the resident mines office, who may be hundreds of kilometres away. (Interview with MTL Consulting, 2019)

Likewise, local government authorities expressed their discontent with how the central government supported the sector in the first years during Magufuli. In particular, they argued that the central government interacted little with local leaders and local problems as the following local politician stated:

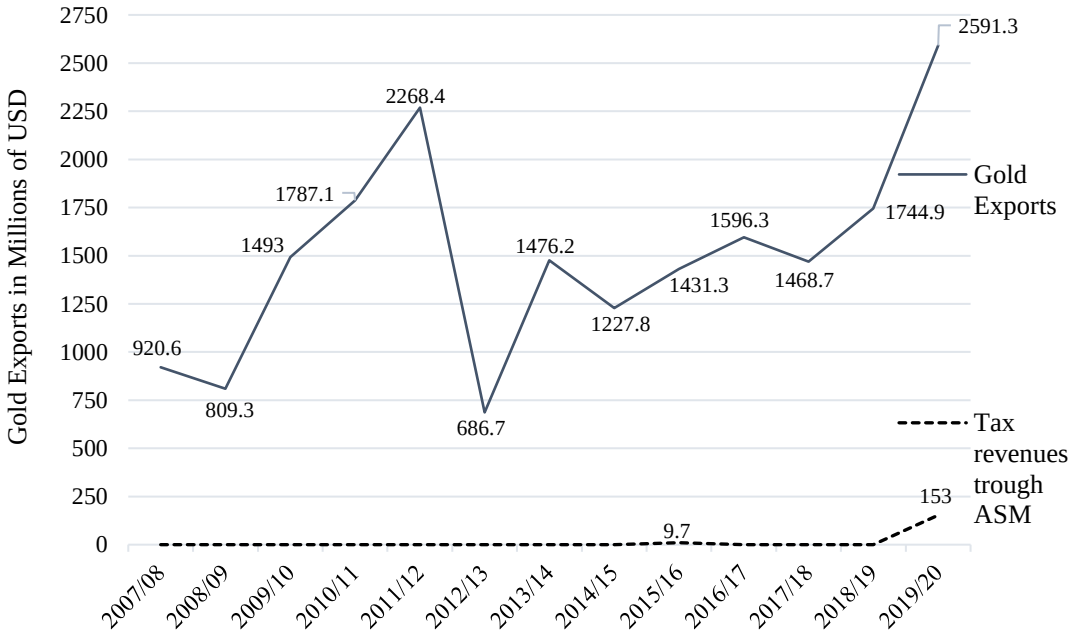
> There is no support from the central government for the local government regarding mineral issues … whether on labour matters, environment, or health standards. They have never attended community meetings to educate people on how they should run mining activities or how village leaders could solve problems related to mining activities. You will only hear that they have visited municipal offices once a year, asked some questions and left, while they were supposed to come and visit the areas, talk to local leaders and citizens, and

advise them … because mining activities and settlement areas are in the same place and they are experts on minerals, so they have knowledge we do not have. (Interview with Chairmen of Village Development Committee, 2019)

Having discussed the 2017 amendments with respect to ASM and having compared these legal changes to the actual political and organisational practices on the ground, I now discuss the effects of these policies on LSM activities. Despite the fact that the 2017 amendments implied deteriorating conditions for foreign investors, Tanzania's gold exports did not decrease in either absolute or relative terms to total exports during Magufuli's first presidential term. Figure 5.5 provides data on Tanzania's gold exports over time. Exports remained around US$1.5 billion in the first three years of Magufuli's term (2015–2017) before increasing to almost US$2.6 billion in 2019/2020. Moreover, as shown in Figure 5.6, the value of gold exports as a share of the total value of exports rose by around 50% in 2015–2020, averaging 35.6% of all exported goods. These higher export values speak against the intuitive argument that the stronger tax levies for LSM companies introduced by the 2017 amendments would lead to decreased production and thus falling exports. Likewise, the evidence might suggest that corruption in the government, and/or LSM companies, was reduced and that the former managed to increase its resource rent base. Likewise, the evidence might

Figure 5.5

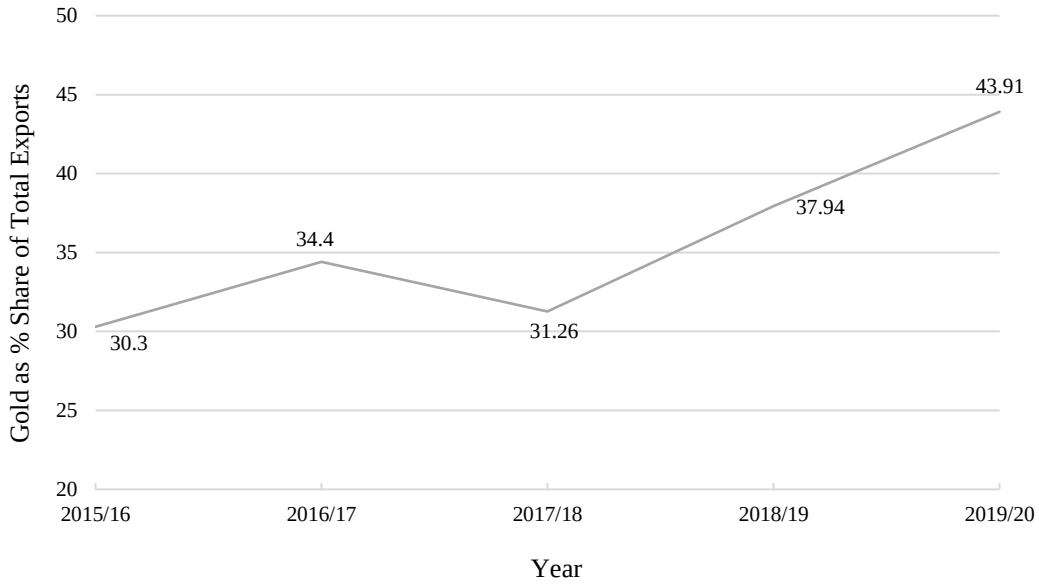
Tanzanian Gold Exports, 2007–2020



Note. Sources: BoT (n.d.-b, p. 23, n.d.-a, p. 21, 2006, pp. 27–29, 2008, p. 27, 2010, p. 27, 2014, p. 24, 2020, p. 22)

Figure 5.6

Gold as Percentage Share of Total Exports, 2015–2020



Note. Source: BoT (2020, Fig. 2.1).

suggest that corruption in the government, and/or LSM companies, was reduced and that the former managed to increase its resource rent base. Even though exploration activities were more reluctantly pursued (Reuters, 2017), six LSGM companies continued to operate in Tanzania (Elbra, 2017). Of these, three were owned by Acacia and one each by AngloGold Shanti, Shanta Mining, and the government (STAMICO) (Elbra, 2017).

These developments in the country's LSM sector require a differentiated reading. Although Magufuli presented his approach to regain national resource sovereignty as a break from the pro-LSM politics of his predecessors, renationalising the mining sector had already started under Kikwete (Paget, 2020b). However, as argued by Paget (2020a), when speaking of exploitation, Magufuli referred to corruption by large companies, but did not refer to the returns of ownership of the means of production and of labour. Thus, one might argue that he did not address more structural aspects of resource ownership, and the distribution of rents, in the country.

Magufuli's approach to the mining sector was received differently by scholars and the international community. Some interpreted his mineral policies as populism, resource nationalism, or even economic war (Cheeseman, 2016; Ippmedia, 2017; Jacob & Pedersen, 2018; The Economist, 2016), while others analysed them as a "masterclass

in political manoeuvring" (Paget, 2017a). Given these different views, I examine how scholars have conceptualised populism.

Populism has been conceptualised in multiple ways; to describe political movements, leaders, parties, decision-making, and ideologies in different geographical, historical and ideological contexts (Gidron & Bonikowski, 2013). A first approach argues that populism is best conceptualised as an ideology. Consequently, programmatic statements of political actors as a bundle of ideas ought to be analysed (Gidron & Bonikowski, 2013). In current-day Tanzania, statements by government members as well as the CCM as a political party would thus be a subject of the analysis. A second approach conceptualises populism as a discursive style. In this regard, de la Torre (2000) describes populism as a "rhetoric that constructs politics as the moral and ethical struggle between the people and the oligarchy" (p. 4). Hence, political practices are analysed (Gidron & Bonikowski, 2013). A third approach defines populism as a political strategy with specific economic policies and repertoires of mass mobilisation (Madrid, 2008). This strategy focuses on three distinct aspects: policy choices, political organisation, and forms of mobilisation (Gidron & Bonikowski, 2013). Madrid (2008) further highlights economic redistribution and the nationalisation of natural resources as important features of populist policies. Even though these three approaches are characterised by different theoretical underpinnings, they also overlap. They share the idea that a populist society can be divided into "the people" who are excluded and an "elite" steering these processes (Paget, 2020a, p. 3). Given this overlap, Magufuli's and the CCM's approach towards mining is next analysed through the lens of a political strategy.

To begin with, the president's rhetoric resonated with past fears in Tanzania about foreign resource extraction. As outlined in the Section 5.4, during Kikwete's presidency, a majority of Tanzanians have been materially excluded from the benefits of gold mining while a small number of corrupt politicians had enriched themselves accruing mineral rents. Taking up this sentiment, Magufuli's policies towards LSM echoed Nyerere's fear of foreign actors extracting Tanzania's resources with little in return and aimed to align his stance on this with Nyerere's. In creating a picture of himself as a man of similar integrity to Nyerere, Magufuli borrowed terms from Tanzania's socialist past such as *unyonyaji* meaning "exploitation" (Paget, 2020a, p. 9).

A second motivation for Magufuli's crackdown on foreign mining might have been to weaken the opposition. Magufuli's adoption of a strong anti-corruption

(dis)course can be explained by looking at domestic policy developments. Chadema, the main opposition party, has its stronghold in Tanzania's Lake Region where it has traditionally been a strong critic of foreign large-scale mining (Paget, 2017a).[107] Under Kikwete from 2005 to 2015, the CCM was increasingly linked to grand corruption in the context of foreign mining investments (Gray, 2012; Paget, 2020a). As Chadema had managed to portray the CCM's corruption as the original source of economic hardship for many Tanzanians, Magufuli now appropriated this discourse (Paget, 2017a, 2020a).

Third, in his first term, Magufuli presented himself as the "leader of the downtrodden" (Mallya, 2018, cited in Paget, 2020a, p. 9) and as "the President of the poor, most conspicuously in the mining … sectors, where artisanal miners and rural smallholders have emerged as important constituencies" (Jacob & Pedersen, 2018, p. 291). Magufuli's approach combined the anti-corruption LSM discourse with popular support for ASM, which had often been vilified by his predecessors. When revoking one of Acacia's prospecting licences and allowing more than 5,000 small miners to stay, Magufuli threatened senior officials at the regional and district level with the sack if they continued to take bribes from large investors (Ippmedia, 2016b). Likewise, some have argued that early gains for ordinary people stemming from populist actions were unlikely to persist in the medium term (Cheeseman, 2016; Collord, 2017). Cheeseman (2016) even argues that in some cases, such as Michael Sata in Zambia, initial anti-corruption actions undermine the institutional landscape of a country, and even leave it worse off than before.

As the end of his first presidential term approached, Magufuli's politics became more and more authoritarian. This included media censorship, the disappearance of journalists, and attacks on the opposition (BBC, 2020; HRW, 2019; Paget, 2020c). Speaking to this, in August 2018, research by a Tanzanian NGO indicated that Magufuli's approval rating had fallen from 96% to 55% between 2016 and 2018 (Materu, 2018). Freeman Mbowe, a fierce critic of the president and chairman of Chadema, was arrested in March 2020 and attacked in June of the same year (Al Jazeera, 2020). Another ardent critic, politician Tundu Lissu was shot in 2017; he survived, but spent three years in exile in Belgium and was only able to return to Tanzania in 2020. Running as Magufuli's opposing candidate in the 2020 General Elections, Lissu

[107] Chama cha Demokrasia na Maendeleo (Chadema) stands for 'The Party for Democracy and Progress'

described Magufuli's political style as "developmentalist arguments to cover up dictatorships" (Ashly, 2020). Lissu is well known in the country for having written extensively about human right abuses linked to large-scale mining and is a member of LEAT.

Tanzania's 2020 general elections brought a landmark victory for Magufuli with 84% of the votes. The results were described as "a fraud and travesty" by both opposition parties while 20 people died in post-election protests, and leaders from Chadema and ACT Wazalendo were arrested (ACT Wazalendo, 2020; BBC, 2020; The Citizen, 2020b). Prior to, and after the election, Magufuli denied the existence of Covid-19 in the country, claiming that vaccines were dangerous, and Tanzanians should pray and inhale herb-infused steam instead (Burke, 2021). Then, after a two-week absence from the public, Magufuli succumbed to the virus in March 2021 (Burke, 2021).

After Magufuli's sudden death, former vice president Samia Suluhu Hassan became Tanzania's first female president. The politics of president Suluhu Hassan, at the time of writing, six months into her tenure, seem to be reversing Magufuli's resource protectionist and authoritarian turn, steering towards re-liberalising the economy. She appointed a new foreign and finance minister, sacked the head of the tax authority, and renewed the focus on FDI with respect to large-scale mining (Schipani, 2021). Moreover, she started to quickly resolve the arguments with Barrick, saying "let's not reach a point where we start to flex our muscles against investors" (Bloomberg, 2021). Yet, it remains to be seen how Suluhu Hassan addresses the ongoing misalignment of ASM legislation and organisational practices and formalisation efforts.[108]

5.6 Conclusion

This chapter scrutinised continuities and changes in the political economy of Tanzania's mining sector covering the period of German colonial rule until 2021. More specifically, the analysis covered the contrasting interests of government officials in the colonial and independent Tanzanian state, of large foreign LSM investors, of the Tanzanian public, and of ASM workers. Even though the context changed dramatically from the British and German colonial times to and after independence, the presence and power of globally operating LSM companies, and the conflict over the sovereignty over

[108] Table 5.1 provides an overview of all legal changes discussed in this chapter.

land and the ownership of minerals, are themes that run continually throughout the country's history. In particular, the chapter examined the ways in which policy paths changed over time; Nyerere's presidency focusing on Tanzania's resource sovereignty gave way to the LSM-liberalising presidencies of Mwinyi and Mkapa. A further policy U-turn was experience with the presidencies of Kikwete and Magufuli, who steered the country towards regaining resource sovereignty.

By analysing the interests of a variety of domestic and foreign actors, the chapter highlighted that scrutinising the role of power, and of conflict, is crucial in understanding the intertwined distributional outcomes in both sectors. Further, by highlighting this interplay of politics, ASM, and LSM over time, the chapter provides the needed political and historical grounding for the empirical analysis that follows. Chapter 6 takes the reader to the two case study sites in Geita Region in northwest Tanzania.

Table 5.1

Legal Changes with Reference to Tanzania's Mining Sector, 1884–2021

Timeframe	Political and economic system	Relevant mining legislation	Changes in the political economy of mining in Tanzania
1884–1918	German colonial rule	1885 Imperial Ordinance	*The colonial state as an extractive state:* ▪ Both colonial states controlled the land and distributed it at their discretion, completely disregarding pre-existing forms of customary land governance. ▪ To create a labour supply for exporting cash crops, but also for mining, the Germans and the British resorted to taxation and coercion. Neither were able to solve the problem of an insufficient supply of labour. ▪ Conflicting interests of white diggers and supervisors and African workers in small as well as large mining surfaced. Small miners, large capital investors, and the colonial state held contrasting interests. ▪ Both colonial states abstained from active infrastructure commitments to mining and, particularly during the British period, conflicts within the state of how to develop the mining industry emerged. ▪ Artisanal but also reef-mining remained of secondary political and thus economic importance compared to cash crop agriculture.
1918–1961	British colonial rule	1920 Mining Ordinance	
1961–1985	Independence and democratic elections: Julius Nyerere	1969 Mining Ordinance 1979 Mining Act	*Reluctance to exploit mineral wealth to maintain resource sovereignty:* ▪ Tanzania embarked on a socialist development path and nationalised key parts of its economy after independence. ▪ Mining was nationalised in 1967 with the aim of leaving minerals underground until domestic capacities existed. ▪ The 1979 Act transferred the ownership of all mineral resources to the state, but was initially designed to attract investment into LSM (Chachage, 1995). At the same time, it allowed Tanzanian citizens to obtain prospecting rights and allowed ASM activities (Jønsson & Fold, 2009). ▪ Mining became economically irrelevant in the 1960s and 1970s.

Timeframe	Political and economic system	Relevant mining legislation	Changes in the political economy of mining in Tanzania
1985–1995	Ali Hassan Mwinyi		*Economic liberalisation of LSM and unequal distribution of resource rents:* ▪ In 1986, Ali Hassan Mwinyi signed a Stand-by Agreement with the IMF and a Structural Adjustment Program (SAP) with the World Bank (Gray, 2012). ▪ Between 1987 and 1989 trade regulations on minerals were liberalised and private trade allowed. One example was MDAs, which offered lucrative terms for investors such as tax waivers on imported goods and fuel, provisions for standard rate income and payroll tax, and tax write-offs for capital expenditures for the year in which capital was acquired (Cooksey & Kelsall, 2011). ▪ The clearing of thousands of small-scale mines in the early 1990s was highly controversial. ▪ The 1998 Mining Act was part of this broader pro-market reform programme, curtailing the government's role to a service-provider and limiting its discretionary power.
1995–2005	Benjamin Mkapa	1997 Investment Act 1998 Mining Act	
2005–2015	Jakaya Kikwete	2010 Mining Act	*A turn towards resource nationalism but ongoing focus on LSM*: ▪ Until 2005, policies regarding the mineral sector were disconnected from poverty reduction strategies (Fisher et al., 2009) ▪ Increasing relevance of ASM and increasing political pressure resulting from this. ▪ On the one hand, the 2010 Act strengthened the power of the state in relation to large investors. On the other hand, mineral rents and FDI in the sector reached a record high.
2015–2021	John Pombe Magufuli	The Natural Wealth and Resources Act 2017 The Natural Wealth and Resources Act 2017 The Written Laws Act 2017	*Resource nationalism towards LSM combined with pro-ASM policies:* ▪ Intensified efforts to reclaim national sovereignty over the country's mineral wealth and domestic value creation. ▪ In 2017, amendments to the 2010 Mining Act occurred, strengthening the government's discretionary power vis-à-vis LSM. ▪ At the same time, Magufuli took a stance supporting the ASM sector by allowing ASM workers to work the grounds of a non-used LSM prospecting licence. Moreover, Magufuli established himself as fighting LSM-related corruption, i.e., the Acacia mining case. ▪ Even though the 2017 amendments attuned Tanzania's mining codes towards a state-led development path, they neither formalised organisational ASM practices nor facilitated access to ASM mining claims.
2021–	Samia Suluhu Hassan		*A turn towards an investor friendly LSM environment?* ▪ Appointed a new foreign and finance minister, sacked the head of the tax authority, and renewed the focus on FDI with respect to large-scale mining (Schipani, 2021). ▪ Wants quarrels with Barrick quickly resolved and is quoted as saying "Let's not reach a point where we start to flex our muscles against investors" (Bloomberg, 2021). ▪ Remains to be seen which path Suluhu Hassan adopts with respect to formalisation efforts of ASM.

6 Empirical Framework: Zooming In on ASGM in Nyarugusu and Mgusu

Chapters 6 to 8 present the empirical core of this research, juxtaposing qualitative and quantitative evidence from both Nyarugusu and Mgusu wards. Chapter 6 scrutinises the thesis's empirical framework and basic survey data. Chapter 7 examines evidence on poverty and the role of ASGM. Chapter 8 analyses ASGM labour, its markets, and its effects on poverty. The remainder of this chapter builds on the discussion of the survey framework outlined in Chapter 3. It begins by discussing the methodological choices made regarding site and field logistics to then examine livelihoods in Nyarugusu and Mgusu. Here, the analysis focuses on sample and household demographics, living conditions, and income-generating activities.

The choice of research methods is inevitably linked to the nature and scope of the research questions addressed (Tashakkori & Creswell, 2007). Therefore, at this point, it is helpful to reintroduce my main research question: to what extent and how have different modes of accumulation in Tanzania's artisanal and small-scale gold mining sector translated into sustainable poverty reduction for rural households over time? The first part of my research question – *to what extent* – requires a quantitative analysis whereas its second dimension – *how* – draws upon a qualitative approach. Moreover, as outlined in Section 3.3.3 and motivated by ontological and methodological considerations after engaging with the relevant literature (Flyvbjerg, 2011; Harrison et al., 2017; Schwandt & Gates, 2018; Yin, 2018), this research deploys a comparative case-study design with the household as the unit of analysis.

As outlined in Chapter 3, in social science research, to account for complex research questions, the value of combining research methods has been increasingly recognised (Creswell & Plano Clark, 2018; Holland & Campbell, 2005). To this end, the thesis is based on a mixed methods framework empirical strategy. First, mining as well as non-mining households were surveyed at the two sites. Subsequently, informed by this quantitative evidence, qualitative interviews were conducted with respondents from the previously surveyed mining households as well as with different ASM stakeholders across Tanzania. Integration of both methods occurred in three ways. First,

the findings of the household survey helped to develop the qualitative questionnaire to enquire how mining households themselves perceive ASGM. Second, informed by my quantitative research and by engaging with existing scholarship, this research conducted policy-oriented expert interviews. Third, I triangulated the qualitative and quantitative evidence. Having outlined my empirical strategy, the next section analyses how the research design, outlined in Section 3.3, was implemented on site and highlights factors affecting field logistics.[109]

6.1 Methodological Choices and Logistics on Site

In Section 3.3.1 we outlined that the design of a survey entails methodological choices. To begin with, a survey draws on a sample, which represents a small fraction of the entire population in a spatially limited analytical unit. A random sample mirrors the true characteristics of the whole population as closely as possible (Fowler, 2014). If this is not the case, sampling error occurs (Scheyvens & Storey, 2003). This can be minimised as follows: first, by not omitting answers of a specific group of people; second, by selecting a sampling frame that ensures certain parts of the population are not systematically omitted in the sampling process; and, third, by selecting a random sample (Fowler, 2014). In doing so, each household in the sampling frame has the same likelihood of being selected for the survey.

This research addressed these aspects as follows. First, the research developed a sampling frame to minimise sampling errors and, by stratifying the sample, the chances of omitting certain socioeconomic groups were minimised. Second, by selecting households randomly, it was ensured that all households stood an equal chance of being surveyed and that the sample resembled the characteristics of the studied area as closely as possible. Last, to minimise omitting certain groups, this chapter explicitly discusses the role of the research assistant and their interaction with the researcher. These different steps are discussed below.

[109] Prior to initiating fieldwork, all relevant paperwork was obtained. In Tanzania, this includes a research permit issued by the Commission of Research and Technology (COSTECH), as well as a residence permit. I also sought permission from the regional administrative officer as well as from the district administrative office.

6.1.1 Creating a Sampling Frame From Scratch

This research deployed random instead of purposive sampling to obtain a panoramic view of all types of households. In line with the research's aims, this not only allows mapping of all livelihood activities, but also a comparative analysis of poverty and ASGM labour. To select households randomly, it is standard procedure to take the national census as a sampling frame and subsequently to randomly select a certain number of households (Deaton, 2000). However, as a full list of households for each village in the ward was absent and administrative changes had taken place since the last population census in 2012, this approach was not viable. Instead, this research developed a sampling frame without a population list (Czaja et al., 2014). Drawing on empirical studies in health research, in such situations, practitioners start random sampling from a central point in a village and select further households randomly between this point and the edges of the village (Bennett et al., 1991). The aim is to select households as randomly and as spatially dispersed as possible.

By adopting such a strategy, this research sought to address this problem of the missing up-to-date list of households. In Nyarugusu and Mgusu wards this technique was aided by the fact that most villages were divided into similarly sized hamlets. Hence, in each hamlet a similar number of households were selected. At the same time, we aimed to include households at the edges of each village while randomly choosing as dispersed a selection as possible. Administratively, Nyarugusu Ward is divided into five villages; Nyarugusu, Busolwa, Ziwani, Mawemeru, and Iririka. In 2012, the year of the most recent population census, the entire ward had a total population of 40,588 (URT, 2013). Unfortunately, more recent, and more disaggregated data were unavailable, as the region, and hence Nyarugusu Ward, was subject to an administrative reshuffle just after the census. Until then, Geita District had been part of Mwanza Region. However, on 1 March 2012, then president Jakaya Kikwete announced that Geita District would become a new region (Daily News, 2012), and Nyarugusu Ward, which had until then had consisted of eight villages, shrunk to five villages.[110]

Mgusu had a population of 7,959 in 2012 (URT, 2013) which then, according to Potter and Lupilya (2016), dropped slightly to 7,598 individuals living in 1520 households. Their numbers were obtained from the District Planning Office in Geita

[110] The three 'lost' villages were Mhama, Wigo, and Nyaruyeye.

Town. According to the village executive officer in Mgusu, the village is split into two parts, Mgusu and Machinjioni. Using corroborating information from different village executive officers in Nyarugusu Ward, we ascertained the following (approximate) household numbers for the five villages;[111] a ward total of 6036 households, of which 1892 were in Nyarugusu, 1313 in Iririka, 540 in Busolwa, 1291 in Ziwani and 1000 in Mawemeru.

These relative population sizes were the base for computing the sample size for each village. Financial and temporal constraints restricted the sample to around 2.1% of the total population in both wards. In practice this translated into sampling 125 out of 6036 households, 2.1% of the total population of Nyarugusu Ward. In Mgusu Ward, 35 out of 1520 households, 2.3% of the ward's total population, were sampled. Sampling each village proportional to its true size led to the following numbers; in Nyarugusu village 41 households, in Iririka 26 households, in Busolwa 11 households, in Ziwani 26 households, and in Mawemeru 21 households. In Mgusu and Machinjioni villages 15 and 20 households were surveyed, respectively. Consequently, the overall sample contained 160 households.

6.1.2 Stratification

A second methodological choice was to stratify for low-, middle- and high-income households. Stratified sampling is a common practice in rural household surveys in developing countries, aiming to cover households which might otherwise be left out of the picture, for example at the lowest end of the socio-economic continuum living in extreme poverty. In this sense, stratification can help to improve data quality and household coverage (Cramer et al., 2014a). To avoid the over- or under-representation of a group, the full sample is divided into heterogeneous groups, which are sought to be relatively internally homogeneous (UNSD, 2005).

Stratifying the sample presented distinct methodological challenges during my fieldwork. First, it was not feasible to determine the relative share of low-, middle-, and high-income households ex ante with confidence because national averages were not helpful in establishing distinct wealth groups given the specific rural context. Thus, this research stratified dynamically by considering the reported incomes of each household

[111] Consulting community leaders in the case of the absence of a full list of all households is a common practice in development research (Bennett et al., 1991).

and then adjusting the corresponding income groups over time. The ranges of these groups were indicatively based on the national mean and median income in Tanzania's latest ILFS from 2014. In 2014, the monthly mean and median income was TZS234,000 (~US$102) and TZS120,000 (~US$52), respectively (URT, 2014). Acknowledging this, the research argues that low-income households are located below the mean income. Thus, low-income households earn a monthly income below TZS250,000, middle-income households fall in a range from TZS250,000–TZS1,000,000, and high-income households are more than TZS1,000,000.[112] It should be noted that such categorisation does not cover all aspects of wealth and instead aims to indicatively group households allowing stratification given these particular circumstances.

One major caveat in choosing reported incomes as a predictor for group stratification is that households possibly under- or over-report their real incomes. Incentives are manifold. One reason for under-reporting real income could be that 'poorer' respondents might expect a relatively higher compensation in terms of social benefits while well-off households might under-report their income to appear less affluent in order to minimise their tax exposure.[113] Another reason would be to limit answers to what is socially desirable (Sumner & Tribe, 2008).

6.1.3 Randomly Selecting Households on the Ground: The Role of Local Gatekeepers, Interview Settings, and Possible Bias

To begin with, a discussion on the role of local village chairpersons and village executive officers is needed. The former is a post, normally given to elderly, popular and well-reputed members of the community. The latter is a political position, usually filled by somebody who is not necessarily native to the community or region. Building a relationship with local gatekeepers is essential, as they provide tacit knowledge of the socioeconomic structures on site and allow researchers to gain acceptance in the local community (Lavrakas, 2008). We quickly established that village chairpersons were highly relevant local gatekeepers, given their longstanding knowledge concerning their community and high social acceptance among most community members. In contrast,

[112] This research set the cut-off line at TZS250,000 (instead of TZS234,000), as the distinct income groups were understood to demarcate indicatively household wealth categories.
[113] Multiple times during our interviews my research assistant and I were asked if we had been sent by the government. When interviewing poorer respondents, many asked for financial and medical assistance, whereas more affluent respondents were afraid that we might be working for the Tanzanian revenue authorities (TRA).

village executive officers were appointed by the ruling party, in this case the CCM, and then placed in the respective ward. For this reason, we considered them to be less embedded in, and knowledgeable about, local structures. The village chairpersons played a vital part in gaining local acceptance and access to local households. After speaking to the regional village executives, the village chairperson in each rural ward helped us to understand the boundaries of each village, how to access the more remote parts of the rural ward, and the prevailing livelihood activities. The practical selection of survey respondents occurred as follows.

Following the methodology introduced by Bennett et al. (1991), we started at a central but random point in the village. Aloyce, my research assistant, and I were accompanied by the respective village chairperson. At both study sites, it was local practice that village outsiders engaging in research activities would be accompanied by a local authority. The reasons behind this were to introduce us, as newcomers to the village, as well-intended and approved by local authorities. Alternating, either Aloyce or I, randomly pointed to a first household. The three of us went there and, if anyone was at home, the village chairperson explained why we were here and asked if the household would like to participate in our survey. We briefly introduced ourselves, explaining the aims of the research and that the survey would take around one hour. If the person agreed, we asked each respondent either in written or oral form for consent and used paper-based questionnaires.

Figuring out a well-functioning work relationship with the village chairperson was relevant both to the success of the survey and to ensure a high data quality. In the early days, Aloyce and I directly started surveying the first household that we had visited with the chairperson, asking the chairperson to leave as the interview began. Once we had completed the survey questionnaire, we often had to wait until the village chairperson, often on foot, returned to the respective dwelling before we could then again randomly select a second survey household. The chairperson would introduce us to this household, leave while we conducted the interview and then our wait for their return began anew. To avoid these long breaks waiting for the chairperson, we tried a different strategy. Instead of selecting one household at a time, we randomly chose three or four households, accompanied by the chairperson. Thus, we accumulated a number of future respondents to minimise our reliance on the chairperson's availability.

This changed approach had a second advantage. Occasionally, the village chairperson suggested a survey household, sometimes, but not necessarily, when they

saw someone in front of a dwelling. Given that a chairperson, as a local political figure, might be interested in framing out contentious issues or certain types of households, we mostly rejected these suggestions. In almost every case, our alternative suggestion, pointing to a nearby dwelling instead, was well received by the chairperson. Also, to avoid any bias being introduced by the presence of the chairperson during interviews, they was asked to leave in case of wanting to stay during the interview. Given the high repute of these chairpersons, and that causing them to lose face would jeopardise our relationship, this was not an easy task but was carried out by Aloyce sensitively.

To avoid overlooking households belonging to a minority group such as tenants, in line with Bennett et al. (1991), we visited households further away from the centre of each village and at the edges of settlements. Moreover, we chose to survey tenant households when being initially introduced to their landlord as well as dwellings with varying housing qualities. All interviews took place at respondents' homes. As argued by Jønsson & Bryceson (2009), enquiring about labour-related themes at off-work sites has the advantage that "knowing ears" are not present (p. 258). Sometimes we were invited to enter a respondent's dwelling, but the large majority of interviews were carried out in front of the dwelling in the shade. Lastly, taking the GPS position of each household helped to obtain a working understanding of the extent of dispersion during the surveying.

Another aspect was that local socio-cultural factors might affect survey responses (Sumner & Tribe, 2008). Generally, household surveys in rural areas are at risk of over-representing male respondents, as in patriarchal societies – which is the case around the Great Lakes – males are often considered to be the natural household head. This might have led to a systemic under-exploration of female voices and views. During the survey, cultural norms and respondents' working hours affected to whom we were able to speak. Given the patriarchal nature of intra-household dynamics in Sukuma culture (Bryceson et al., 2010) and hence at both study sites, household members took it for granted that we would want to speak to the most senior male in the household. However, during daytime many men were not at home, so we interviewed their spouses instead. Most male household members were absent during our interviews which took place in daylight, between 7am and 6 pm; this applied to ASGM workers in particular, who left home before sunrise to commute to the mining pit, and returned after sunset. Female household members were also more likely to be at home during

interview hours as they were in charge of most domestic tasks such as childcare, cooking, and cleaning.

The sensitivity of culture-specific gender-roles in the context of intra-household dynamics is exemplified by in-interview situations when male household heads unexpectedly arrived home and often demanded detailed explanations as to why we were interviewing their spouse. Often, the male head of the household would then continue the interview. When this happened, we observed that male respondents were able to give more accurate descriptions of income and expenditure behaviour of the household when being aided by their spouses. Usually, female respondents had a better understanding of calculating everyday expenses, which makes sense, as they were responsible for the household economy, buying food and other goods. Having said this, when other household members were present, 'family interviews' occurred which helped to elicit specific information on the type of employment pursued by individual household members.

The 'proxy respondents' might have introduced bias, as spouses had rather limited knowledge of the specific ASGM labour activities, income, working conditions, etc. of their partners.[114] In such situations, my research assistant and I resorted to other family members present, seeking to triangulate their responses. Nevertheless, the absence of male ASGM workers during interviews could have led to the following biases. First, this might translate into an underestimation of waged ASGM activities, as Mueller's (2011) evidence on casual labour in Tanzania's agriculture showed that it is not socially desirable to work for somebody else. As households might be "ashamed and hesitant to admit that they work as kibarua [casual waged laborers]" (Mueller, 2011, p. 34), they might waged informal labour. Second, spouses might tend to overstate incomes from self-account mining. Both biases are addressed in the qualitative part of our fieldwork, when detailed and targeted questions on the sector were addressed exclusively to ASGM workers.

[114] Proxy respondents (e.g., female household heads) answered questions on behalf of other household members. It might be socially desirable for them to omit that female/underaged household members pursue waged-activities (Cramer et al., 2020).

6.1.4 The Role of the Research Assistant

Having discussed these possible biases of the survey's results, it is equally important to reflect on the role of power relations between the researcher, research assistant, and respondents. To begin with, a first important aspect was to recruit a research assistant fluent in the local language, Sukuma, and knowledgeable about the Great Lakes Region. Textbooks on empirical research emphasise that conducting surveys and interviews in the respondents' native tongue is vital in order not to mute vulnerable groups such individuals with little to no formal education or the elderly (Desai & Potter, 2006).[115] This is important, as those groups might have only a rudimentary command of Swahili and hence could be under-represented. Through my placement as a research affiliate at REPOA, a think-tank based in Dar es Salaam, I was able to access a local network of research assistants. During my search, I became acquainted with Aloyce Seni, a learned research assistant with over a decade of fieldwork experience across Tanzania and a university degree. As emphasised by Devereux and Hoddinott (1993), the best research assistants are an "ambassador at large" (p. 27). This was the case with Aloyce, who as a Sukuma, was not only aware of cultural subtleties in the study area, able to engage with Sukuma-only speakers and able to quickly build trust with different groups of the local population. Deane and Stevano (2016) emphasise the role of local research assistants in ensuring high data quality. They highlight the importance of reflecting on how data are generated during fieldwork, focusing specifically on the power relations between the researcher, the researched *and* the research assistant. Following their claim that this is an important part of fieldwork, the analysis shortly reviews the roles of the research assistant and the researcher during both fieldwork stays.

Both of us were present during all fieldwork activities. Aloyce acted as interpreter when needed, but generally took the lead during the interviews. This was motivated by the premise that any interference by the researcher during the interview process might have a detrimental impact on the quality of the materials obtained. Either because the flow of the interview might be affected adversely or due to unfolding detrimental power asymmetries between myself and the interviewees; for example,

[115] This is often emphasised in the context of qualitative research. However, during my household survey, it was equally important to being able to switch to the local language, for example to differentiate one employment status from another.

unease by the interviewee that they might have said something 'wrong' (Deane & Stevano, 2016). Given this passive role, the reader might be asking why I was present in any case.

First, my presence allowed for a joint discussion of daily impressions and observations made during our survey and to make possible adjustments – particularly, in the case of misleading questions. This was essential during the pilot phase, for example, when we asked for different employment statuses to understand the work situations of respondents. Second, Aloyce and I were able to jointly discuss novel themes which arose during the interviews, which again allowed the wording and scope of questions to be adjusted. Regarding qualitative saturation, we discussed to what degree themes and stories were starting to repeat themselves (B. Saunders et al., 2018). Once this happened after around 24 interviews, we then stopped the qualitative research process. By being present during all stages of the data-generating process, I gained a thorough understanding of the everyday lives of the respondents, gathering observational evidence at both case study sites. A further important aspect was our local embeddedness in the research context, highlighted next.

For the duration of our fieldwork in Nyarugusu, we relocated from Geita Town to Nyarugusu Ward and stayed in a local guesthouse. The guesthouse was an ideal place to meet local miners, bar personnel and, occasionally, foreign mineral traders. Being embedded in Nyarugusu village in this manner allowed us to obtain valuable insights into the settings and everyday lives of the people living and working in, as well as outside, the ASGM realm in the ward. Most importantly, being embedded directly in the village – being approachable outside of the interview process and our role of researchers – seemed to foster acceptance and trust among villagers and future respondents. This is consistent with Jønsson and Bryceson (2009), who, during their survey, participated in village activities to establish trust. Lastly, during the survey, we travelled to households either on foot or, for more distant parts of the ward, by motorcycle.

In Mgusu Ward, fieldwork conditions and logistics were different and somewhat more complex. Mgusu is located roughly a forty-minute car drive from Geita Town. As the only lodging possibilities were neither safe nor equipped with electricity, Aloyce and I commuted daily from Geita Town to Mgusu. This lower degree of embeddedness meant that we could not make the same type of in-depth observations we had obtained in Nyarugusu Ward. However, through a local village chairperson, we

were again able to gain a better understanding of the structure of the rural ward and its inhabitants. Having discussed the ways in which interaction with the research assistant took place and the logistics on site, the remainder of this chapter scrutinises the sample's as well as household demographics before analysing the housing infrastructure and the prevalence of distinct livelihood activities.

6.2 Livelihoods in Nyarugusu and Mgusu

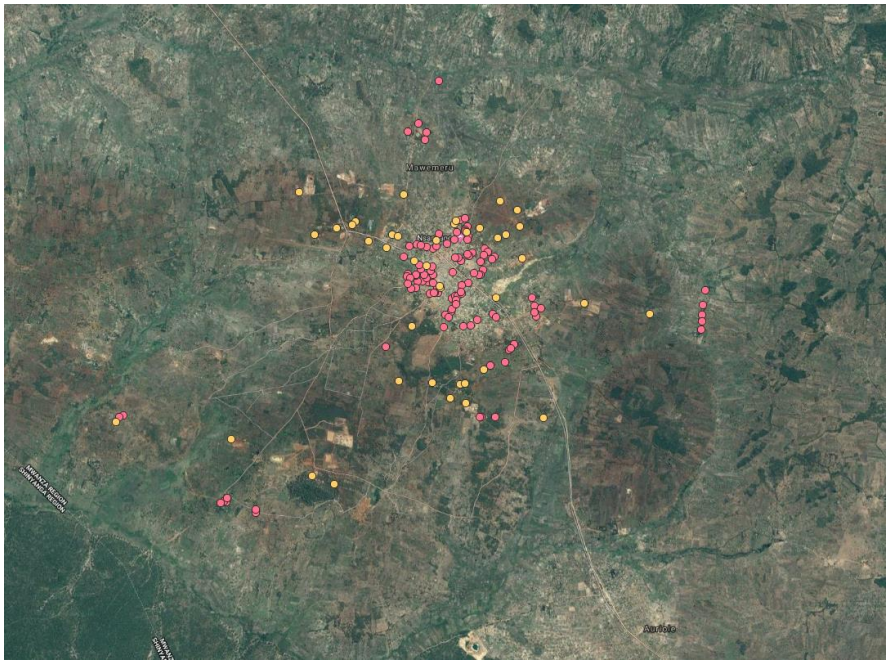
6.2.1 Sample and Household Demographics

As outlined above, the survey covered 160 households in Nyarugusu and Mgusu wards. This is around 2.1% of the total population, allowing a comprehensive analysis of socio-economic realities, labour structures, and dynamics on site. Figure 6.1 provides the locations of surveyed households (red dots) as well as of the mining, mineral processing, and refining sites (yellow dots) in Nyarugusu Ward. Hence, the red dots are primary data while the yellow datapoints refer to secondary data from the International Peace Information Service (IPIS), collected between 2017 and 2019. This was an in-depth survey of 447 small-scale mining and processing sites in northwest Tanzania (Merket, 2019). IPIS' disaggregated firm-level data enrich and complement my household survey findings by providing information on licensing, site infrastructure, workers' mobility, and numbers. It also adds detailed information on production processes and trading networks in the Geita Region.[116] Figure 6.2 provides the same information for Mgusu Ward where 35 households were sampled, 15 in Mgusu village and 20 in Machinjioni village. As Figure 6.2 shows, only two mining sites in the hills in Mgusu were recorded by IPIS, both belonging to the Mgusu Miners Cooperative Society. Washing and processing sites next to the river were not surveyed.

[116] The interactive webmap provided by IPIS yields a dynamic picture of the mining and processing sites in Nyarugusu and Mgusu wards (https://ipisresearch.be/mapping/webmapping/tza/v1/#-3.3/32.8/6/2/1/).

Figure 6.1

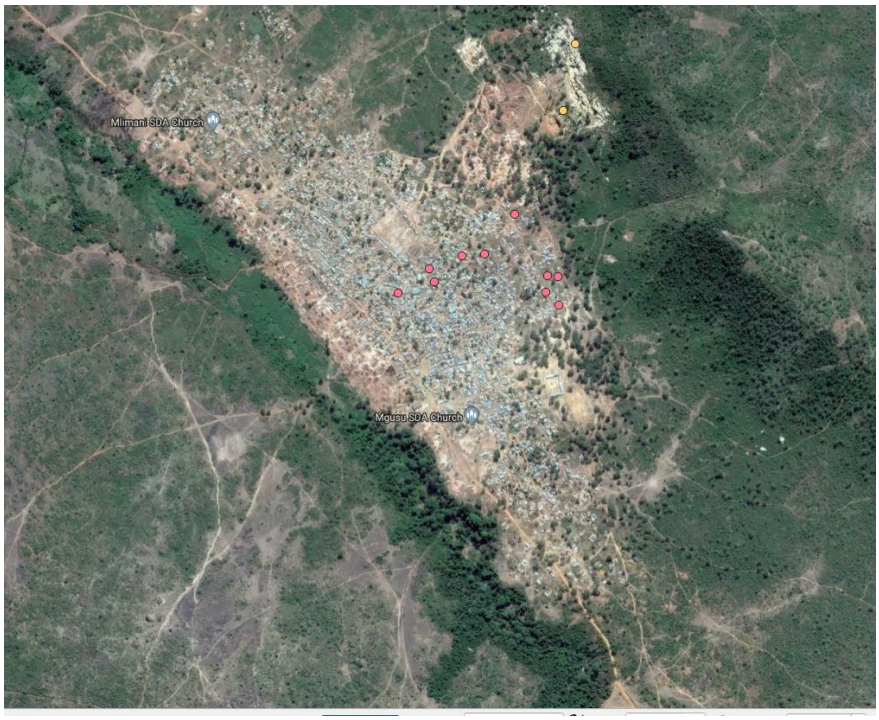
Map of Nyarugusu Ward



Note. Surveyed households (red dots) and mining sites (yellow dots)

Figure 6.2

Map of Mgusu Ward



Note. Same colour scheme as above[117]

[117] During the survey in Mgusu, not all the GPS coordinates of the surveyed households were captured due to a combination of a few days of sickness of the author and bad mobile network of Aloyce Seni.

As discussed in Section 6.1.2, the sample was stratified ex post into three distinct income groups by considering the national mean and median income of Tanzania. As highlighted by Table 6.1, low-income households made up nearly two-thirds of the Nyarugusu sample – 66.40%, while medium- and high-income households accounted for 26.40% and 7.20%, respectively. In Mgusu, around two-thirds of the sample were low-income households, roughly 29% middle-income and around 6% high-income households. Overall, this mirrors the distribution in Nyarugusu Ward closely. Having outlined the characteristics of the sample, the next paragraphs analyse the structure and demographics of the households surveyed.

A first important finding concerning population demographics was that 74.4% and 91.4% of sampled households in Nyarugusu and Mgusu, respectively, are immigrants. The survey defined respondents as immigrants if their family is not originally from the village of residence. These high rates corroborate previous research on the migratory and transitory nature of gold mining settlements in Tanzania (Bryceson et al., 2012; Bryceson & Geenen, 2016; Mwaipopo et al., 2004). Having said this, Table 6.2 indicates that half of the sampled immigrant households had immigrated 20 years or more previously. Disaggregating by location, around 60% of migrant households in Nyarugusu had moved there more than 20 years ago, while in Mgusu this was the case for only 30% of migrants. The high prevalence of migration in Nyarugusu is corroborated by another study by Jønsson et al. (2019), which found that none of its 36 respondents had been born in the village and that on average they had lived there for around 23 years. Their numbers, combined with my data, underline the maturity of

Table 6.1

Income Strata by Location

	Nyarugusu			Mgusu			Full sample		
Income strata	n	%	cum.	n	%	cum.	n	%	cum.
Low	83	66.40	66.40	23	65.71	65.71	106	66.25	66.25
Middle	33	26.40	92.80	10	28.57	94.28	43	26.88	93.13
High	9	7.20	100.00	2	5.71	100.00	11	6.88	100.00
Total	125	100.00		35	100.00		160	100.00	

Note. Source: Own data. The ranges of these income strata calculated ex-post are as follows. Low: TZS0 > household income < TZS250,000; middle: TZS250,000 < household income < TZS1,000,000; and high: household income > TZS1,000,000.

Table 6.2

Household Migration Dates

When the household migrated to Nyarugusu and Mgusu	n	%	cum.
Less than 5 years ago (2021–n)	12	10.17	10.17
More than 5 and less than 10 years ago	19	16.10	26.27
More than 10 and less than 20 years ago	27	22.88	49.15
More than 20 years ago	60	50.85	100.00

Note. Source: Own data

Nyarugusu as an ASM settlement. Mgusu is no longer a nascent ASM settlement, as reported previously by Mwaipopo et al. (2004), but has become well-established.

In Nyarugusu, the most frequent places of origin of migrated households were Simiyu, Shinyanga, Mwanza and Geita Region – all located in northwest Tanzania. The most prevalent ethnic group were the Sukuma, representing 62% of all households. Other ethnic groups present included Sumbwa (6%), Ha (6%), Zinza (4%), Nyamwezi (4%) and Nyiramba (4%). In Mgusu, as in Nyarugusu, most migrants were from regions in northwest Tanzania and had travelled considerable distances of 300 to 400 kilometres.[118] Moreover, the most prevalent ethnic group were again the Sukuma, representing around 50.3% of all surveyed households in Mgusu Ward. Less prevalent ethnic groups were the Ha (17.3%), Kuria (9.4%), Jita (7.9%) and Hangaza (4.2%). Most households sampled in Nyarugusu were Christian (70.4%), 16.0% were Muslim, and 14% were either traditional or non-believers. Similarly, 77.5% of households in Mgusu Ward were Christian and 15% Muslim (15%) while 7.9% were either traditional or non-believers.

The average household size was 6.2 persons, although differences surfaced across the five villages constituting Nyarugusu Ward (Nyarugusu village 6.6, Mwamemeru 5.7, Ziwani 5.7, Iririka 7.1, Busolwa 5.5). The average household size in Mgusu Ward was 6.6 people, being 6.9 in Mgusu village and 6.1 in Machinjioni village. In general, these numbers are consistent with the latest (2018) numbers on Geita Region when an average size of 6.3 persons was reported (NBS, 2019). Compared to this, the national average for rural areas – 4.9 persons in 2018 (NBS, 2019) – is low. Our reported average household sizes were also lower than the household size of 7.9 reported by Mwaipopo et al. (2004) for the same areas. As emphasised in Section 4.2,

[118] The most frequent districts of origin are: Bariadi (350km from Mgusu), Musoma (350km), Sengerema (85km), Ngara (260km), Bunda (280km) and Kasulu (400 km from Mgusu).

our survey defined household members as individuals that either financially contribute to, or are supported by, the household budget. This different conceptualisation might be one reason why our reported household sizes are higher than the official numbers but lower than the 2004 data. Further reasons might be that rural cultural norms have changed over these 15 years, translating into an increased use of contraceptives, or that the added value of an additional household member as income-generator decreased over time.

With respect to the age structure, over two-thirds of the sample population at both sites were below the age of 30 years. Table 6.3 provides an overview of the age structure of both settlements. The largest group were the 14-year olds and younger, representing almost 44% (Nyarugusu) and 45% (Mgusu). Then the 15 to 29-year olds, constituting around 27% and 29% in Nyarugusu and Mgusu, respectively, followed. This implies a skewed age structure with a majority of children. At the other end of the age continuum, only around 10% of all surveyed individuals were over 45. Looking at official demographic data, 45% of Tanzania's total population is younger than 14 years of age (UNESCO, 2016). Thus, the sample mirrors the national demographics.

A large proportion of young people translates into high dependency ratios. Before empirically analysing dependency ratios, the section discusses the methodological options in calculating such ratios. The dependency ratio of a household is calculated by looking at the number of dependants, children and elderly, in relation to working adults. In other words, the dependency ratio indicates the pressure on the 'productive' population. This productive population is usually understood as all

Table 6.3

Age Structure by Groups and Location

Age groups	Nyarugusu			Mgusu		
	n	%	cum.	n	%	cum.
14 years old and under	340	43.59	43.59	86	45.03	45.03
15–29 years	207	26.54	70.13	55	28.80	73.83
30–44 years	102	13.08	83.21	30	15.71	89.54
45–64 years	101	12.95	96.15	19	9.95	99.49
65 years old and over	29	3.72	99.87	1	0.52	100.00
Missing	1	0.13	100.00			100.00
Total		780			191	

Note. Source: Own data

household members aged between 15 and 64, while the dependant population is generally considered as the group aged 14 or younger and 65 and older (Rowland, 2003). However, in the context of this research, the underlying premises of such an age dependency ratio might be problematic for two reasons. First, it has been well established that in developing economies many children contribute to household incomes in the form of non-household work (Hadley et al., 2011). Hence, labour practices as well as "age-specific productivity profiles" are context-specific (Hadley et al., 2011, p. 645). Leaving them out of the picture might distort dependency ratios. Second, as low levels of formal education might translate into limited knowledge regarding dates of birth, problems of age heaping and clustering around specific numbers might arise (Hadley et al., 2011).[119] This, in turn, might introduce bias to the ages reported. Being aware of these limitations, I chose to calculate the dependency ratios by looking at the actual numbers of contributors and dependants in my data. To this end, individuals contributing financially were considered 'contributors' while 'dependants' were those either too old, too young, or physically unable to contribute financially. [120] This methodology allowed me to circumvent the above outlined problems. The next paragraph discusses distinct dependency rates across my sample.

Calculating the ratio of contributors to dependants across each household yielded an average dependency ratio of 134% in Nyarugusu Ward. This indicates a high degree of economic distress for working individuals (Shelley, 2015). Table 6.4, presenting the disaggregated village-level data, shows that all villages are characterised by very high dependency ratios. One reason for the relatively lower dependency ratio in Busolwa might be the strong prevalence of temporary living arrangements such as tents. These mining camps are predominantly occupied by young males whose nuclear family rarely accompanies them. This might also explain why the lowest average

[119] According to A'Hearn et al. (2009), age heaping occurs if "[i]ndividuals lacking certain knowledge of their age (..) choose instead a figure they deem plausible. They do not choose randomly but have a systematic tendency to prefer "attractive" numbers, such as those ending in 5 or 0, even numbers, or—in some numbers with other specific terminal digits" (p. 786).

[120] This research abstained from looking at individual incomes to decide who contributes and who does not as these only reflect the last 30 days and might be subject to single payments. Household members who contributed through household and caretaking work but did not contribute financially, were categorised as 'dependants'. I am aware that this is problematic, as non-marketed labour, such as care activities, end up being considered of less value than income earned in the labour market. However, this devaluing of care work seems to be the norm in the harsh financial environment of my area of study, so my research decided to focus on the financial contribution dimension only.

Table 6.4

Dependency Ratios of Households by Location

Ward	Village	Dependency ratio
Nyarugusu	Nyarugusu	134.4
	Mawemeru	200.0
	Ziwani	148.2
	Ririka	222.6
	Busolwa	118.9
Mgusu	Mgusu	157.8
	Machinjioni	166.7

Note. Source: Own data. Contains income contributors and dependants.

household size across the sample is in Busolwa (5.5), hinting that mining is the primary reason for many young males migrating to this part of Nyarugusu Ward. Further implications of a high dependency ratio are readdressed in Chapter 7, discussing different poverty measures. In Mgusu Ward, an equally high dependency ratio of 161.62% was found. Again, a small number of working household members were under pressure to provide sufficient income and food for their dependants.

Table 6.5 provides an overview of the educational background of all sampled individuals. However, it should be noted that the levels of primary education are distorted by the high percentage of young individuals that are currently in education. As it might be interesting to cover highest educational attainment only, in the following this section reconsiders this group. The data were probed to assess the degree to which

Table 6.5

Educational Attainment Including Those Currently Attending School by Location

Highest level of education attained	Nyarugusu			Mgusu		
	n	%	cum.	n	%	cum.
Underage	125	16.03	16.03	34	17.80	17.80
None	74	9.49	25.52	4	2.09	19.89
Primary	460	58.97	84.49	130	68.06	87.95
Secondary ordinary level	109	13.97	98.46	19	9.95	97.9
Secondary advanced level	2	0.26	98.72	1	0.52	98.42
College	4	0.51	99.23	1	0.52	98.94
University	2	0.26	99.49	2	1.05	100
Other	3	0.38	99.87			
Missing	1	0.13	100.00			
Total	780			191		

Note. Source: Own data.

children of primary school age were not attending school. Of the 177 children aged 14 or younger, only three were not attending school. Consequently, 174 respondents, as they were still in education, were excluded from the dataset. The adjusted data are given in Table 6.6.

Having made these adjustments, the data show that in Nyarugusu, around 59% of all individuals completed primary school education, but around 16% did not receive any formal education at all. In Mgusu, the relative share of individuals aged 14 or younger was high. Hence, again, it is instrumental to exclude this group, to obtain a better understanding of the educational formation of the work force in Mgusu. With these adjustments, 76% of all sampled individuals had completed primary education, around 10% had completed secondary school, and roughly 4% had no formal education at all. Finding data on national numbers concerning education is difficult but a comparison between the reported numbers and Tanzanians that are currently enrolled can be drawn. According to Human Rights Watch (HRW, 2017), 60% of all Tanzanian adolescents are enrolled in, or have finished, lower secondary education. The higher national average indicates that both ASGM communities are characterised by low educational levels.

Table 6.6

Educational Attainment Excluding Those Currently Attending School by Location

Highest level of education attained	Nyarugusu			Mgusu		
	n	%	cum.	n	%	cum.
Missing values	1	0.23	0.23	0	0.00	0.00
None	71	16.14	16.36	4	3.81	3.81
Primary	258	58.64	75.00	80	76.19	80.00
Secondary ordinary level	102	23.18	98.18	17	16.19	96.19
Secondary advanced level	2	0.45	98.64	1	0.95	97.14
College	4	0.91	99.55	1	0.95	98.10
University	2	0.45	100.00	2	1.90	100.00
Total	440			105		

Note. Source: Own data.

6.2.2 Living Arrangements and Access to Basic Infrastructure

The large majority of households lived in their own dwelling. In Nyarugusu, 77.6% owned their homes while 18.4% were tenants. The remaining 4% were living in temporary accommodation. In Mgusu Ward a similar picture emerged. There, 85% of

all households owned their dwelling, whereas 15% were tenants. These numbers are consistent with the latest national survey data; in 2018, 85% of surveyed rural households owned their dwellings (World Bank, 2020b). In Nyarugusu, 76% of migrant households were living in their own residential property, while 81% of indigenous households lived in their own dwellings.[121] Thus, the origin of a household did not affect homeownership rates.

Looking at the physical conditions of housing, although differences across both sites are found, my data resembled national statistics. Most dwellings in Nyarugusu Ward (98%), and all in Mgusu, were equipped with a corrugated roof made of iron and/or steel. In Nyarugusu and Mgusu, 57.2% and 50.3%, respectively, of the dwellings had floors made of cement and 41.7% and 49.7%, respectively, of earth. Comparing these numbers to the latest national data, in 2018, in 66% of all dwellings across rural Tanzania the floors were made of earth (World Bank, 2020b). With respect to the material of walls; 78% of all surveyed dwellings had baked bricks or cement as walls, which is slightly higher than the rural average of 71% (World Bank, 2020b). At the same time, one should be cautious in equating these housing conditions to poverty, as housing might be a misleading predictor of household wealth given the transitory and migratory nature of ASM settlements (Jønsson & Bryceson, 2017). See for example Busolwa Village, where around 50% of the surveyed households were tent-like accommodations with UN tarpaulins attached to wooden poles.[122] In contrast with the more mature mining areas in the rest of Nyarugusu Ward, living conditions in Bulsowa reflected the rush and temporary nature of this site. Focusing on housing conditions alone would have led to misinterpreting the actual economic situation of households.[123]

In Nyarugusu, the majority of households, around 55.2%, fetched their water from a safe and clean well owned by a private individual, which this research calls 'a protected private well'. The owner charged TZS50 (US¢2) per 20 litres. The well is around 50 to 100 meters deep and reaches groundwater and, thus, is safe and clean. Moreover, 14.4% of households fetched water from a safe, public well without paying a fee. This means that 69.6% of households were using safe water sources. In 2018,

[121] This thesis defines migration as the first generation not being originally from the respective village.
[122] Jønsson et al. (2019) share these observations.
[123] Werthmann's (2010) description of mining camps in Burkina Faso as "translocal" (p. 112) underlines that miners only stay as long as the soil provides the relevant resources to them. Even though, first and foremost, remaining at a mining site might be driven by the amount of remaining ore body, other aspects, such as being able to lead an alternative lifestyle in a less hierarchical rural environment, might also affect migratory choices (Werthmann, 2010).

across rural Tanzania, 66% of households had access to these improved water sources (World Bank, 2020b).[124] At the same time, 30.4% of all households fetched water from unprotected sources including wells, springs, dams and lakes, as well as using surface water. These numbers indicate both the dependency of households on private wells and the health-related risks for those who can neither afford to pay to access these nor live close to a protected public well. Mgusu Ward revealed similar numbers with one difference being that many were able to access a free, thus public, well. The survey found that 37.1% of the surveyed households in Mgusu sourced water from a safe public well, whereas around 22.9% paid a fee to access clean well water and around 28.6% fetched water from unprotected sources. Interestingly, around 11.4% of households there bought bottled water. Even though the overall situation in rural Tanzania is reported to have improved from 2012 to 2018 (World Bank, 2020b), many households continue to lack access to safe drinking water.

Our observations further suggest that a household's location within the ward as well as its income levels affected their choice of water source. For example, 34% of low-income households and none of the high-income households sourced their water from an unprotected source, indicating that there is a negative correlation between income and the quality of drinking water. In Nyarugusu village, observations during the survey revealed a strong dependency of many households on a single privately-owned well. The well's owner, a wealthy local miner, not only owned PMLs but also guesthouses in Nyarugusu village and Geita Town (interview with GEREMA, 2019). The observation that a household's location affects where they source water speaks to previous findings by Abreu (2012) and Wall and Johnston (2008).

Levels of electrification were low and location specific. While 16% of sampled households in Nyarugusu were connected to the public electric grid, the whole of Mgusu Ward was unconnected. In comparison, the 2017/2018 HBS found that 10.4% of rural Tanzanian households were connected (World Bank, 2020b).[125] It is also worthwhile to note that 16.3% of the 160 surveyed households reported using a solar panel. Comparing this to the HBS 2017/18 findings, this is rather low, as 33% of all rural households were then reported to use solar power as a lighting source (World Bank, 2020b). Instead, most surveyed households used a torch, a gas lamp, or a

[124] This definition of improved water sources is in line with the WHO (2017) definition.
[125] In Geita Region, 12.2% of all households are connected to the public grid. However, the percentage of rural electrified households in Geita Region is most likely lower (NBS, 2019).

generator as a source of light or electricity. Energy sources for cooking were rudimentary; in both wards, over 99% of all households used firewood and charcoal. These numbers are similar to the 2017/2018 HBS, which reported that 97% of rural households use firewood, animal residues, coal or charcoal (World Bank, 2020b).

Last, in terms of sanitation with respect to toilet facilities, in Nyarugusu Ward 60.9% of all households used a non-concrete pit latrine, while 30.9% used a modern pit latrine. In Mgusu, 50.3% of all households used a non-concrete pit latrine, while 38.2% owned a modern pit latrine. Moreover, 6.7% and 11.5% of households in Nyarugusu and Mgusu, respectively, did not own a latrine and most of these used their neighbour's. This is similar to the national averages; in 2010, 10% of rural households in Tanzania did not have access to sanitation facilities (World Bank, 2020b).

6.2.3 Mapping Livelihood Activities

This section maps household income-generating activities at both study sites to analyse the relative importance of distinct income activities. Previous research has shown that rural households engage in a wide range of economic activities to minimise risk (e.g., Barrett et al., 2001). As discussed in the shortcomings of surveys that only report primary jobs, questionnaires must take this into account. For this reason, the survey did not enquire about the primary job, aiming instead to acquire information related to all income-generating activities of each household member within the 12 months prior to the survey. For the purpose of this study a household is classified as pursuing a particular economic activity if at least one of its member(s) is engaged in it. Moreover, a household member might pursue more than one income-generating activity at the same time. Table 6.7 summarises the prevalence of livelihood activities at both sites.

The data report different degrees of livelihood diversification, even though ASGM was of paramount importance at both settlements. In Nyarugusu, around 69% of households were engaged in ASGM compared to over 90% in Mgusu. At the same time, crop farming was pursued by 71.2% of all households in Nyarugusu and was thus an equally important livelihood activity. Less frequent were running small food services and shops, ranging from selling tomatoes to carpentry. In Mgusu, however, only 14%

Table 6.7

Prevalence of Income-Generating Activities by Location

Type of income activity	Nyarugusu		Mgusu	
	n	%	n	%
Crop farming	89	71.2	5	14.3
Employee LSGM	1	0.8	0	0
ASGM	87	69.6	32	94.3
Employee (non-mining)	16	12.8	3	8.6
Food service	10	8.0	2	5.71
Shop	13	10.4	1	2.9
Other business	47	37.6	16	45.7

Note. Source: Own data. The total number of income activities (n) exceeds the total number of households in each ward, as a household might be engaged in more than one income-generating activity at the same time.

of households engaged in farming activities and, thus, ASGM constituted by far the most important income source there. To conclude, while households in Nyarugusu were able to diversify their economic activities, this was not the case in Mgusu.

It should also be noted that the relative importance of ASGM activities in Nyarugusu changed over time as the ward was subject to mineral rushes. In 2004, around 14% of all surveyed households in the ward were pursuing ASGM activities (Mwaipopo et al., 2004), while in 2011, 41% reported mining as their main activity (Jønsson et al., 2019).[126] Yet, in September 2011, mineral strikes in neighbouring Nyaruyeye Ward led Nyarugusu's inhabitants to work in Nyaruyeye and to an influx of thousands of new miners there (Jønsson et al., 2019). This underlines that the prevalence of ASGM activities, despite Nyarugusu's maturity as a mining site, is subject to change over time.

Moreover, location affected the degree to which households were able to diversify their income-generating activities. In Mgusu, the scarcity of land shaped the nature of livelihood activities as it could only support a limited amount of farming activities. Evidence on the size of average agricultural land reinforces this point. Households in Mgusu owned, on average, only 0.4 acres of arable land while in Nyarugusu the average was 1.2 acres. The scarcity of arable land in Mgusu, due to its geographic location in a valley, was also exacerbated by the fact that most land is explored and exploited for mining activities.

[126] Jønsson et al. (2019) report that respondents were asked in 2011 to what degree they had pursued mining activities ten years ago. Given this methodology, their findings of 61% of ASM activities (n=36) seem to be less robust than the findings of Mwaipopo et al. (2004).

The interconnectedness between both livelihood activities is in line with earlier empirical writings on the nexus of ASM and farming in other countries in SSA such as Ghana (Okoh & Hilson, 2011) and Sierra Leone (Cartier & Bürge, 2011). In the case of Nyarugusu Ward, my survey revealed that a majority of ASM households pursued a dual strategy. As highlighted in Chapter 3, particularly in Table 3.2, most households in the ward that engaged in ASGM activities did so during the dry season from April until August, switching to farming for the rest of the year. This supports the narrative that ASM is more of a complement to, rather than a substitute for, subsistence farming (Cartier & Bürge, 2011). By contrast, in Mgusu Ward, given the scarcity of land, mining replaced farming.[127]

6.3 Conclusion

The chapter began by discussing methodological choices on site, including the technical aspects of tailoring a context-specific research methodology. Developing a sampling frame, stratifying the sample and randomly selecting households were rather technical aspects. By discussing the role of local gatekeepers as well of my research assistant, and our interaction, the chapter contains concrete methodological lessons on how fieldwork ought to be critically reflected upon. Putting these methodological choices to work, the chapter familiarised the reader with the living conditions at both sites, culminating in a number of findings. It found high levels of migration, as most households had immigrated to both mining sites more than 10 years ago. Moreover, large numbers of individuals below the age of 14 translated into marked dependency ratios. Additionally, we have seen that access to clean drinking water was limited, electricity largely absent, and living conditions differed. The latter was exemplified by the fact that most dwellings outside of Busolwa had a corrugated roof while in Busolwa many tent-like dwellings continue to exist. This indicates that most households had decided to settle and only few live a temporary lifestyle. Moreover, although ASGM activities were of marked importance at both study sites, livelihoods are more diversified in Nyarugusu than in Mgusu ward; this can best be explained as the result of a combination of physical geography and the maturity of Nyarugusu Ward as an ASGM settlement. As the reader by now hopefully has a rough idea of the living

[127] The interconnectedness of both income activities and their impact on poverty is discussed in more detail in Section 7.1.2.

conditions and livelihood activities at both sites, the next chapter scrutinises poverty dynamics and ASGM's impact on them.

7 Poverty and the Role of ASGM

> Mining has never really helped me to escape from poverty because I only get small amounts which we use only for family consumption; and it is not enough because sometimes we go to sleep hungry. Life is very tough in mining areas. We do not get money to improve our living standards, we only get money to buy food.
>
> Interview with Digger 3, 2019

> It [ASGM] has helped me a lot because I used to be a farmer but did not make any progress through farming. When I decided to engage in mining, my income grew profusely, quite different from when I was a farmer. In mineral extraction there is a lot of money, but you have to work hard … I used to dig and farm at the same time. So, by doing these two activities at once I was able to collect enough income and when I decided to stop digging and farming, I fully engaged in only buying gold through sponsoring miners. Through mining activities, I have expanded my income sources, was able to build a house and to send my children to a good school. I have enough money to help my family in the case of health issues and my family is eating well. So now I am beyond the poverty line, and I thank God for that.
>
> Interview with Sponsor, 2019

The two quotes above tell contrasting stories about how ASGM has shaped socioeconomic realities. The first, by a digger from Nyarugusu Ward, speaks of prevailing low incomes, only sufficient for mere survival. The second, by a former miner and now sponsor from Mgusu Ward, draws a contrasting picture. Here, ASGM was a stepping stone to higher income activities such as sponsoring miners and trading minerals. To deepen our understanding of how ASGM activities translate into distinct socioeconomic outcomes such as reducing poverty (or not), this chapter not only examines quantitative data on poverty but also qualitative evidence. Furthermore, the chapter juxtaposes evidence from both Nyarugusu and Mgusu wards. The chapter's

structure is as follows. First, it discusses how the existing deficiencies of money-metric poverty measures can be tempered by other types of quantitative indicators. This part of the chapter develops an asset-based index and discusses the vulnerability of households to shocks. Second, it examines respondent-based views of how ASGM has, or has not, helped them to reduce poverty. It concludes by integrating both approaches and by situating the findings in the wider literature.

7.1 Measuring Poverty: Quantitative Indicators

We have seen in Section 4.3 that measuring poverty in a quantitative way is often argued to reduce its complexity as a social phenomenon. One such widely used methodology is to define a monetary threshold under which individuals are considered as living in poverty. The next paragraphs briefly summarise the limitations and advantages of both money-based and asset-based measurements of poverty, by synthesising the discussion in Section 4.3.

7.1.1 Deficiencies of Money- and Asset-Based Poverty Measures

Measuring poverty through monetary measures has attracted distinct types of criticism. Its critics question the meaningfulness of poverty lines and argue that they are reductionist. They contend that by defining poverty in a binary manner, poverty lines fall short of providing a deeper analytical value of the multidimensionality of deprivation and its implications in non-material terms (Saith, 2005). Scholars further question whether an intrinsically meaningful cut-off line which defines when someone is living in poverty, and when not, actually exists. Those who consider such a line as "intrinsically meaningful" agree that defining poverty as a shortage of money captures what it means to live in deprivation (Saith, 2005, p. 4605). This money-based definition is subject to a set of objections.

First, poverty is linked to other forms of socioeconomic hardship, which are not displayed by quantifiable measures. This ranges from lacking access to basic public services such as water, education and electricity; exposure to precarious work conditions such as overwork, long commutes, job insecurity, and being exposed to violence, to name but a few (Saith, 2005). All these non-material aspects are underexplored by money-based poverty exercises. Second, money-metric approaches automatically link incomes above the poverty cut-off line to higher levels of wellbeing.

Thus, it is assumed – but not tested – if these higher levels of wellbeing are actually present in reality. Structural disadvantages such as low-quality public infrastructure translating into poor education and health facilities, and that higher quality public infrastructure might essentially be absent, go unchecked. Thus, by applying a narrow understanding of poverty, money-based poverty exercises underexplore the complexity of the processes of social exclusion which feed back into material disadvantages. Third, the methodological underpinnings of money-based poverty lines are contested, i.e. how food baskets and household equivalent scales are defined, and how regional differences in diets and prices levels are addressed. To begin with, it is assumed that all individuals have the same nutritional needs (Ravallion & Bidani, 1994). This is problematic as certain groups, particularly manual labourers, require above average calorie intakes (Saith, 2005). Adding to these distinct nutritional needs of individuals, rural households might consume different goods baskets than assumed in poverty exercises, and tastes and food preferences might differ across urban and rural households (Ravallion & Bidani, 1994). Moreover, rural households might face higher prices as they are not able to buy in bulk (Fischer, 2018), and transportation costs are higher in remote areas (Ravallion & Bidani, 1994). At the same time, households might be clustered around the poverty line (Fischer, 2018). Consequently, slight recalculations of the basket of goods consumed and/or its pricing, affects the levels of poverty observed (Székely et al., 2000). These different aspects underline that methodological choices affect the findings on quantitative poverty.

Lastly, note that these methodological choices are shaped by political, thus normative, decisions. This requires unpacking the power dynamics behind them. First, quantitative measures, given their reduced complexity, are easy to communicate to the public. This might be a major reason why, despite their shortcomings, they remain the preferred metric of many donor governments, IFIs, and researchers. As a result, poverty is reduced only to the monetary dimension, with no attention to the structural drivers of poverty. Second, external pressures might affect choices when constructing poverty lines. In the Global South, government budgets are tight and anti-poverty policies costly (Fischer, 2018). Thus, governments might prefer reporting lower poverty rates by choosing lower calorie levels, not adjusting price levels to inflation, or relying on outdated household data. At the same time, there might be incentives to report higher poverty rates to accrue additional aid funding.

The above considerations show why scholars are questioning the value of money-based poverty measurement exercises and why non-monetary measures are gaining increasing popularity. One methodology is to apply asset indices as a proxy to assess household wealth (Johnston & Abreu, 2016). Assets, or the lack thereof, are argued to indicate financial security or insecurity, and are thus perceived to be a valid measurement of households' capacity to respond to unexpected shocks in the absence of other insurance mechanisms (Brandolini et al., 2010); accumulating assets as "precautionary savings" is contended to be the main mechanism for many households to cushion income volatility (p. 268). For instance, after a bad harvest, a rural household might sell a durable asset, such as a motorcycle, to cushion income losses from farming.

Advocates of asset-based measurements of poverty argue that asset data are easy to collect and to include in a survey (Filmer & Pritchett, 2001). Moreover, assets predict a household's long-term wellbeing as households need to accrue savings to acquire them and given their costliness and longevity they reflect past wealth (Johnston & Abreu, 2016). Last, by identifying ownership patterns, asset indices are contended to be particularly useful when measuring wealth differentiation in the form of rankings (Johnston & Abreu, 2016). Naturally, some scholars disagree and have put forth a set of methodological objections to asset-based measurements of poverty. They argue that asset indices do not reflect changing preferences and relative prices, and the age and depreciation of assets are not reported, important factors affecting the actual value of assets, whose value might thus be overstated (Harttgen et al., 2013). Moreover, it has been argued that asset-based indexes are not good at differentiating wealth inequality across rural households, as many studies' default lists of assets are based on the characteristics of urban households. Adding to this, the 'clumping of assets', meaning that there are only a limited number of different asset scores, may limit an index's explanatory power (McKenzie, 2005). A final criticism is that assets only provide a snapshot at a certain point in time, while income and expenditure are accrued (and can be measured) over a longer time period, and are thus flow variables. They contend that assets ought to be analysed as a measure of wellbeing over longer time horizons.

Given this scholarly contention, it is pivotal to understand exactly what an asset index measures. The rationale is to understand the unobserved variable behind specific ownership patterns and, in this sense, certain patterns of assets are contended to be a good set of predictors reflecting wellbeing (Johnston & Abreu, 2016). Thus, assets are

selected on the premise that they can tell us something about wealth differentiation (Johnston & Abreu, 2016).

Having outlined the debate over the disadvantages and advantages of money- and asset-based poverty measures, the chapter analyses the results of this study's survey on poverty as follows. First, the analysis compares poverty lines in 2019 to the findings by Mwaipopo et al. (2004) at both case study sites. The main aim is to assess today's situation compared to 2004. Also, acknowledging the limitations of a money-based measurements, the chapter analyses the shocks experienced by households over the last 12 months as well as an asset index. Second, in light of the inability of quantitative measures to depict qualitative dimensions of poverty and the mechanisms behind it, the thesis examines qualitative data obtained from interviewing miners and sectoral stakeholders. This is done to integrate the self-perception of respondents and to ground the concept of wellbeing discussed in local understandings of deprivation and not only in a crude calculation of quantitative poverty. The remainder of this section applies my household survey data to construct, and most importantly to discuss, the pros and cons of different quantitative poverty indicators.

7.1.2 Poverty Lines

As examined in Section 4.3, money-based poverty lines are based on assuming a standardised calorie requirement. This research thus had to follow the World Bank's assumption of a daily calorie intake of 2,200 kcal per adult. Subsequently, the 251 most common food items consumed by 10%–50% of Tanzania's population were considered (NBS, 2019; World Bank, 2020b).[128] The price levels used to calculate the costs of this food basket were adjusted in 2018 for inflation through a Consumer Price Deflator (World Bank, 2020b). One shortcoming of applying a Consumer Price Index Deflator is that the food prices, in the case of Tanzania, were collected exclusively in main urban food markets (World Bank, 2020b). However, as discussed in Section 4.3, rural households might face higher prices (Fischer, 2018). Unfortunately, given the time and monetary constraints faced by a small research project, this research was neither able to collect prices paid by households nor their diets.

[128] In 2015, the same level, 2,200 kcal per day, was assumed (World Bank, 2015b). The calorie level was calculated by taking the 2nd to 5th quintiles of the distribution of consumption levels (World Bank, 2015b). This is framed as 'the cost of basic needs methodology' (World Bank, 2015b).

Based on the outlined methodology, in 2018, Tanzania's food poverty line stood at TZS33,748 per adult equivalent per month (NBS, 2019), equivalent to around US$14.75. The basic needs poverty line, TZS49,320 per adult in 2018, added an allowance for basic non-food items (World Bank, 2020b).[129] A household exposed to basic needs poverty is, by definition, food poor. At the same time, as discussed in Section 4.2, households share resources and thus economies of scale unfold. The larger the size of a household, the stronger this effect might be. To account for this, this research adopted the OECD's modified consumption unit scale where the first adult of a household receives a weight of one, all other adults receive a weight of 0.5 and each child receives a weight of 0.3.[130] Consequently, each household member received a respective weight.

The calculation of the poverty headcount ratio was as follows. First, a dummy variable was created, taking the value 1 if a household's total income y_i is below the poverty line p_i (Equation (1)). The poverty line was adjusted by the equivalent scale of each household outlined above. The subindex i stands for each individual household, HC is the number of individuals living in poverty, M the number of sampled households, and N the number of all sampled individuals. Equation (2) reflects the number of people below the poverty line. Last, dividing HC by N, yielded the Headcount Ratio (HCR).

$$I\ (p,z) = 1\ if\ y_i \leq\ p_i \qquad (1)$$

$$I\ (p,z) = 0\ if\ y_i \geq p_i$$

$$HC = \sum_{i=1}^{M} I\ (y,p)\ n_i \qquad (2)$$

$$N = \sum_{i=1}^{M} n_i$$

$$HCR = \frac{HC}{N} \qquad (3)$$

[129] As suggested by the World Bank (2015), the HBS 2011/12 basic needs poverty line (TZS36,482) and the food poverty line (TZS26,085.5) were readjusted for inflation in 2018. By applying different measures of Consumer Price Indices (CPI), an inflation level of 26% between 2012 and 2018 was found (World Bank, 2020b).

[130] The cut-off line between adults and children was defined as being 14 years. As discussed in Section 4.3, it is important to bear in mind that applying a specific scale is shaped by certain technical assumptions of economies of scales and by value judgements.

Table 7.1 depicts the HCR at the household level of the 2019 survey and compares it to the 2004 data. The following findings emerge. First, the 2019 rates for the entire sample were higher than the rates reported by Mwaipopo et al. (2004). Food poverty in 2019 stood at 32%, while it was 25% in 2004. Basic needs poverty was 43% in 2019, whereas it was 35% in 2004. Second, both poverty lines were lower in Mgusu than in Nyarugusu. In 2019, 26% and 34% of all households in Mgusu and Nyarugusu, respectively, were exposed to food poverty. Moreover, 37% and 45% of all households in Mgusu and Nyarugusu, respectively, experienced basic needs poverty. Third, both settlements had higher degrees of poverty than the HBS 2017/18 indicates. One reason for these higher numbers might be the readjustment of the national poverty lines, to reflect inflation, from 2012–2019.[131] The fact that, in 2019, more people were considered to be living in poverty, indicates that the nominal incomes of these households might have increased to a lesser degree than prices. To conclude, poverty continued to be a defining feature of both settlements.

To obtain a better understanding of poverty at both sites, the data were further disaggregated. Households headed by a female are significantly more likely to be exposed to both food and basic needs poverty. Overall, 22 female-headed households consisting of 113 individuals were sampled. Of these, 54.6% of all individuals were living below the basic needs poverty line and 36.4% in food poverty (see Table 7.2). A

Table 7.1

Income-Based Poverty: Survey vs. Official Data by Location (%)

	National data on rural households	Full sample		Nyarugusu	Mgusu
	2017/18	2004	2019	2019	
Basic needs poverty	31.3	35.0	43.1	44.8	37.1
Food poverty	9.7	25.0	31.9	33.6	25.7

Note. Sources: Own data, Mwaipopo et al. (2004), and HBS 2017/18. To allow comparability, the 2019 numbers are on the household level and not on the individual level. Incomes were aggregated to the household level and compared to equivalised household poverty lines.

[131] Basing the calculation of food as well as basic needs poverty rates on the 2011/12 national poverty lines, similar rates to those found by Mwaipopo et al. (2004) emerge.

Table 7.2

Income-Based Poverty: Female-Headed Households (%)

Type of poverty indicator	Female-headed households
Basic needs poverty	54.6
Food poverty	36.4

Note. Source: Own data

further dimension of disaggregation is how the poverty status of a household is linked to its engagement in distinct income-generating activities.

To obtain a better understanding of how ASGM affect a household's likelihood of living in poverty, the analysis starts by comparing poverty rates across mining and non-mining households. Note that this is first and foremost an exploratory exercise and not an indicator of a causal relationship in the sense that ASGM translates into or reduces poverty, as there might be other (unobservable) variables affecting a household's poverty status.

To begin with, as shown in Table 7.3, poverty rates differed only slightly across non-mining and mining households. In the full sample, 32.5% of all mining households were food poor compared to 30.0% of all non-mining households. However, location matters. In Nyarugusu, non-mining households were three and four percentage points less likely to be exposed to food and basic needs poverty, respectively, than their mining counterparts. This might be explained by the fact that they were able to embark on an income-diversification strategy at times of low ASGM income. Moreover, as 94% of sampled households in Mgusu were engaged in ASGM, a poverty comparison between ASGM and non-ASGM households is not helpful. Nevertheless, it is worth noting that food poverty rates across ASGM households in Mgusu were lower than in Nyarugusu,

Table 7.3

Income-Based Poverty: Non-Mining vs. Mining Households by Location (%)

	Full sample		Nyarugusu		Mgusu	
	Non-mining	Mining	Non-mining	Mining	Non-mining	Mining
Basic needs poverty	40.0	44.2	42.1	46.0	0.0	39.4
Food poverty	30.0	32.5	31.6	34.5	0.0	27.3

Note. Source: Own data. A mining household had one or more household members engaged in ASGM-related activities in the last 12 months. As calculating the headcount poverty rate across all individuals implicitly defines non-mining individuals in a mining household as 'miners', this research calculated poverty rates to compare non-mining to mining households on the household instead of the individual level.

standing at 27% and 34%, respectively. Overall, the data suggest that Mgusu is a more dynamic ASGM site where households are, on average, less poor. Nyarugusu, as a more mature mining settlement with a more diversified economy, provides alternative income-generating activities. Here, mining households fare worse than non-mining households. The reasons behind this cannot be understood without analysing context-specific factors such as its ASGM labour market, as Chapter 8 will show.

The data do not allow, therefore, the establishment of a simple relationship between ASGM and poverty. The degree to which ASGM affects a household's poverty level depends on a combination of locality and of the type of livelihood activities engaged in. The relationship is not straightforward. In Nyarugusu being a non-mining household is advantageous, while in Mgusu mining households fare better than the average household in Nyarugusu.

Households engaging in agriculture and ASGM tend to be more likely to be found in both forms of poverty, as shown in Table 7.4. Across the sample, 25% of households were engaged in agricultural but not in ASGM activities; whereas 24.4% of households pursued both ASGM and agricultural activities. Within the former group, 59% and 46% were below the basic needs and food poverty lines, respectively. Households focusing on farming only were less likely to be living in poverty: 47.5% and 40% were basic needs and food poor, respectively. The numbers for Nyarugusu were similar to these findings, as in Mgusu only two households engaged in farming. Possible reasons behind the higher poverty rates of households that farmed and mined at the same time are not straightforward. One aspect might be self-selection in the sense that more affluent households specialise in one income-generating activity.

Table 7.4

Income-Based Poverty: Farming Households by Location (%)

	Full sample		Nyarugusu	
	Agriculture and ASGM	Agriculture but no ASGM	Agriculture and ASGM	Agriculture but no ASGM
Basic needs poverty	59.0	47.5	50.0	42.1
Food poverty	46.2	40.0	46.0	42.1

Note. Source: Own data.

Previously, we have emphasised that other variables might shape the impact of ASGM on household poverty. For this reason, we continued to explore this relationship by conducting a probit analysis, following Fisher et al. (2009) as well as Mwaipopo et al. (2004).[132] Beginning with factors shaping basic needs poverty, both growing their own food and living in a female-headed household makes it more likely that an individual is exposed to poverty. Most relevant here is the question of how ASGM affects poverty. Here, statistically significant at a 10% level, pursuing ASGM activities has a positive impact on food as well as on basic needs poverty.

Moreover, drawing on Fisher et al. (2009) and Mwaipopo et al. (2004), a probit analysis was run to analyse which aspects make it more likely that a household had either experienced food or basic needs poverty. As highlighted in Table 7.5, households who produced their own food, were female-led, or had a higher dependency ratio were more likely to experience food poverty. This speaks to the findings by Fisher et al. (2009) and is as expected. Surprisingly, engaging in ASM made it more likely to experience food poverty. The results are similar for basic needs poverty. This both confirms but also contrasts findings by Fisher et al. (2009), who reported that mining in a pit makes it more likely to be affected by a food shortage but at the same time less likely to be living in food or basic needs poverty. The remainder of this chapter adds an asset index as well as a qualitative analysis to explore their contradicting evidence.

Table 7.5

Probit Regression Results

Dependent variable	Food poverty	Basic needs poverty
Constant	–1.220**	–1.037**
Nyarugusu	–0.143	0.019
Someone in the household engages in ASGM	0.375**	0.362**
Loss of food aid	0.240	–0.041
Produces own food	0.732**	0.493**
Dependency ratio	0.001**	0.002**
Female-headed household	0.322**	0.538**

Note. Source: Own data. n=965. * significant at 10% level; ** significant at 5% level

[132] Both of these studies apply household level information to conduct a probit analysis, whereas this research drew on individual level data to calculate the probit scores.

The finding that poverty has increased in both settlements over the last 15 years (2004-2019) requires further qualification. A first possible limitation – despite the sampling strategy discussed in Sections 3.3.1 and 6.1 – might be a migration bias in the data. We have seen in Chapter 6 that both settlements share high levels of migration. A majority of households who migrated to both case study sites between 2004 and 2019 might have been driven by poverty. At the same time, the 'winners' of the ASM lottery might have left the settlement at some point during this time period. These factors combined could lead to a high fraction of low-income households remaining in the sector while the ones who were lucky in striking gold emigrated to larger cities. Consequently, this research might underestimate the poverty-reducing ability of the sector, as it does not capture workers who struck gold and left the sector. Here, qualitative evidence helps to triangulate the quantitative findings.

A second aspect is that the data only provide a snapshot at the time of the household survey. Thus, the analysis is unable to elucidate temporal changes of incomes, as my survey only captured the previous 30 days of incomes and expenditures. We have discussed earlier that the survey was rolled out during the dry season in spring when mining production is usually high. Consequently, ASGM activities and incomes reported then might have been higher than during other times of the year. Testing this claim, Table 3.2 indicated that ASGM activities in our sample remained high throughout the year. This contradicts other findings which suggest that the sector has a seasonal nature (Hilson & Garforth, 2012; Maponga & Ngorima, 2003). Additionally, to account for this possible bias, this research conducted qualitative interviews during the rainy season in autumn when ASGM incomes might have been lower.

Having outlined the possible limitations of the data on income-based poverty presented so far, and to further test their robustness, the next paragraphs scrutinise expenditure-based poverty lines. Complementing and corroborating income-based poverty measures by expenditure data has been deemed useful in research (Hussain, 2003; P. Saunders et al., 2002). Note that expenditure-based measures, similar to income-based indicators, do not acknowledge intra-household allocation and thus cannot tell us about the situation of different household members (Ray, 2015). In particular, vulnerable household members such as women might be exposed to household inequality. To calculate expenditure-based poverty rates, the analysis applied the same individual weights as when calculating the household specific poverty lines previously.

Looking at the expenditure-based poverty rates in Table 7.6, a slightly different set of findings emerges. First, applying expenditure data yields lower poverty levels than income data. Deploying expenditures, basic needs, and food poverty were 1.9 and 10 percentage points lower, respectively. These differences are most likely caused by over-reporting expenditures in combination with under-reporting, whether deliberately or not, incomes vis-à-vis expenditures. Second, consistent with the calculated income-based measures, poverty levels were lower in Mgusu. Moreover, analysing mining vs. non-mining households based on expenditure data compared to income data, no significant differences between poverty levels were found (see Table 7.7).

The analysis has discussed the prevalence of poverty, applying different poverty lines. However, as outlined in Section 4.3, this approach is insensitive to the depth of poverty, and policies based on the HCR favour individuals close to the poverty line. To obtain a first understanding of the depth of poverty, the distance between a household's income and the poverty line was calculated. If the value is greater than zero, the individual is above the poverty line, while a negative value implies that poverty prevails. Figure 7.1 displays their distribution. It is worth noting that around 25% of households above the poverty threshold remain clustered closely around the poverty line. Advancing this, the income gap ratio (IGR) helps to capture the "acuteness" of poverty

Table 7.6

Expenditure-Based Poverty by Location (%)

	Full sample		Nyarugusu	Mgusu
	2004	2019	2019	
Basic needs poverty	35.0	41.3	41.6	40.0
Food poverty	25.0	21.9	23.2	17.1

Note. Sources: Own data and Mwaipopo et al. (2004).

Table 7.7

Expenditure-Based Poverty: Non-Mining vs. Mining Households by Location (%)

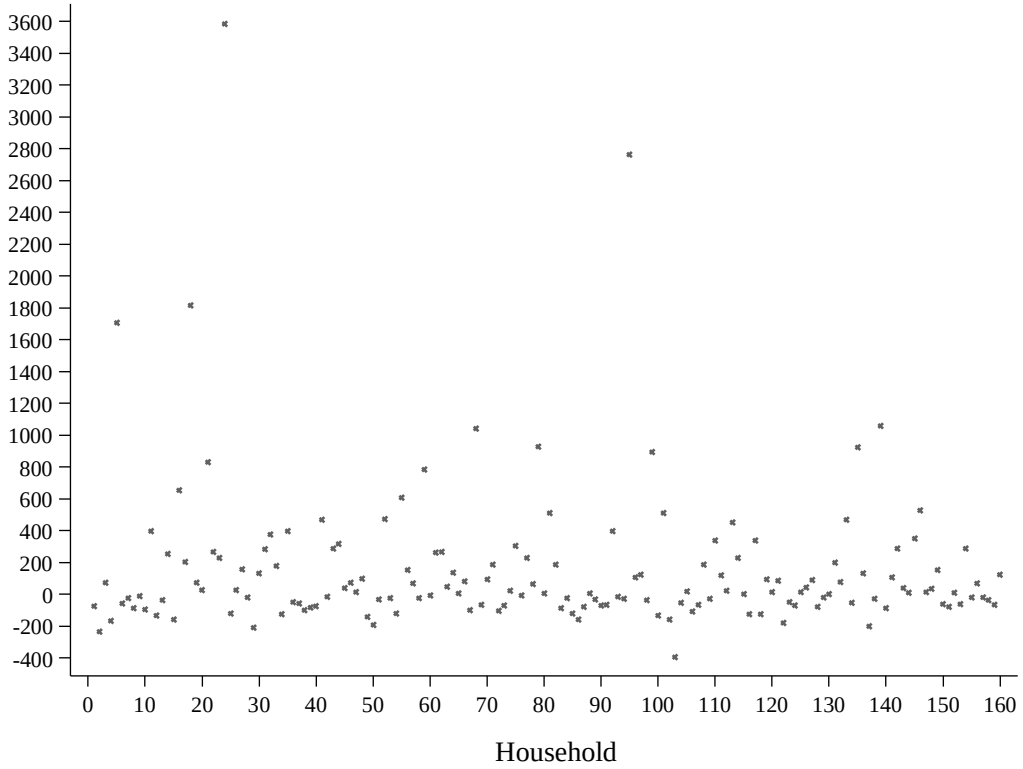
	Full sample		Nyarugusu		Mgusu	
	Non-mining	Mining	Non-mining	Mining	Non-mining	Mining
Basic needs poverty	40.0	41.7	42.1	41.4	0.0	42.4
Food poverty	22.5	21.7	23.7	23.0	0.0	18.2

Note. Source: Own data. The explanatory power of zero poverty reported for non-mining households in Mgusu is limited as only three out of 35 households were not mining. See Table 6.7.

by describing poverty relative to the income needed to escape poverty (Ray, 2015, p. 254). Note that the HCR is the number of people living in poverty. Computing the *IGR* by using the food poverty line as the benchmark for poverty generates a value of TZS210.81. This is the per capita amount needed to bring all people living in poverty – assuming perfect targeting of cash transfers – above the food poverty line.[133] The larger the IGR, the more resources are needed to lift individuals out of poverty.

Figure 7.1

Distance of a Household to the Poverty Line in TZS1,000



Note. Source: Own data.

7.1.3 Vulnerability

Having outlined the prevailing poverty rates in both settlements, this section analyses the households' vulnerability to shocks. Analysing vulnerability provides a more dynamic picture of material realities over time while poverty lines provide a snapshot of a household's money-metric poverty profile at a specific point in time only.

[133] The IGR does not capture distinct effects of changes in prices levels and how these might affect the poor differently depending on if they are consuming or producing the respective good, for example, rice (Ray, 2015). The Foster-Greer-Thorbecke (FGT) class of indices addresses distributional aspects of poverty but given length limitations, the thesis abstains from discussing them in more detail.

By addressing households' exposure to shocks, we address the criticism that poverty lines are silent regarding non-quantifiable deprivation. Table 7.8 displays different shocks experienced in the last 12 months. The most relevant shocks were a lack of money, low mineral prices, a shortage of food, and temporary as well as long-term sickness of a household member. Interestingly, only food shortage, the failure to recover money lent to others, and a loss of remittances from personal contacts were statistically significant.

Food shortages occurred more frequently in Mgusu where 60% of households had experienced such hardship in the last 12 months, compared to 32% in Nyarugusu. This large gap might be linked to the scarcity of farming land in Mgusu Ward in combination with its high population to land ratio. This is not the case in Nyarugusu Ward, where, as discussed previously, many households pursue a variety of livelihood activities outside ASGM. The finding that households in Mgusu are more exposed to food shortages than their counterparts in Nyarugusu contradicts previous evidence that food poverty in Mgusu is less prevalent than in Nyarugusu ward (Table 7.1 & Table 7.5). Here, a contrast between external and subjective measures of deprivation emerges. To address this, the chapter integrates qualitative findings on poverty in Section 7.2.

Table 7.8

Shocks Experienced Within the Last 12 Months by Location (%)

Type of shock in %	Nyarugusu	Mgusu
Food shortage	32.00**	60.00**
Low mineral prices	44.80	48.57
Sick household member	37.60	45.71
Long-term sickness of a household member	25.60	14.29
Lack of money	82.40	94.29
Loss of food aid	3.20	0.00
Involved in conflict	1.60	2.86
Mining-related health problem	6.40	5.71
Mining-related legal problem	2.40	2.86
Theft or loss/damage of property	4.80	5.71
Fire accident	1.60	2.86
Failure to recover money lent to others	10.00**	25.71**
Failure to pay back loan from formal or informal source	0.80	0.00
Loss of remittances	7.20**	20.00**

Note. Source: Own data. Chi-square: *significant at 10% level; ** significant at 5% level

To sharpen the analysis of exposure to shocks, and drawing on Fisher et al. (2009, p. 37), the chapter further explores the interaction of household characteristics with selected shocks identified in Table 7.8. The main aim of this cross-tabulation is to test to what degree vulnerability and poverty measures point in the same direction. The results are displayed in Table 7.9. Looking at the first two rows, a strong, statistically significant, correlation between having experienced a food shortage and being poor exists, as 78% and 82% of respondents who had experienced a food shortage were basic needs and food poor, respectively. Moreover, unsurprisingly, 90% of households with at least one member working in ASGM had experienced low mineral prices. Interestingly, 95% of ASGM households had experienced a money shortage, 15% more than their non-mining peers. Households with a female head were 28.7 percentage points less likely to have experienced low mineral prices. This might echo the fact that ASGM continues to be a male-dominated sector. Furthermore, 72% of farming households surveyed (defined as at least one household member engaging in agricultural activities over the last 12 months) had experienced a food shortage while 58% of non-farming households did not. This might be explained by the fact that migrant households were characterised by different degrees of being unable to recover money lent to another person; whereas 15% of immigrant households had experienced such a shock, this was the case for only 3% of non-migrant households.

Comparing the above to the findings by Fisher et al. (2009), a marked overlap exists. Both the 2004 and 2019 data indicate that households which were food and basic needs poor were particularly likely to having experienced a food shortage. Further similarities were found regarding the fact that ASM households were exposed to low mineral prices.

To conclude, households at both case study settlements are exposed to high levels of insecurity in the form of external shocks. These shocks are linked to certain household characteristics such as being food or basic needs poor or while engaging in certain livelihood activities. Previous discussion emphasised that one factor that helps to protect against unexpected shocks is the sale of assets. Thus, the next section analyses the prevalence of distinct types of assets among the surveyed households.

Table 7.9

Correlation Between Reported Statistically Significant Shocks and Distinct Household Characteristics (%)

		Food shortage	Low mineral price	Lack of money	Failure to recover money lent to another person	Failure to pay back loan from formal or informal source	Loss of remittances
Food poverty	Non-poor	58.72	83.33	89.91	11.01	3.67	21.10
	Poor	82.35	75.00	96.08	15.69	0.00	13.73
	Chi-square	**					
Basic needs poverty	Non-poor	57.14	85.19	89.01	12.09	3.30	21.98
	Poor	78.26	75.00	95.65	13.04	1.45	14.49
	Chi-square	**		*			
Female-headed household	Yes	77.27	22.73	86.36	18.18	4.55	20.29
	No	64.49	51.45	92.75	11.59	2.17	9.09
	Chi-square		**				
ASGM household	Yes	67.50	89.87	95.83	14.17	1.67	21.67
	No	62.50	33.33	80.00	7.50	5.00	10.00
	Chi-square		**	**			*
Farming household	Yes	72.34	75.00	91.49	9.57	1.06	13.83
	No	57.58	88.10	92.42	16.67	4.55	25.76
	Chi-square	**	*				*
Household engaged in farming and ASGM	Yes	73.85	55.38	95.38	9.23	0.00	15.38
	No	61.05	42.11	89.47	14.74	4.21	21.05
	Chi-square	*	*			*	
Migrant household	Yes	69.60	48.00	92.80	15.20	3.20	20.00
	No	54.29	45.71	88.57	2.86	0.00	14.29
	Chi-square	*			**		

Note. Source: Own data. Adapted from Fisher et al. (2009). Shocks reported include the last 12 months prior to the survey and longer. Chi-square: * significant at 10% level; ** significant at 5% level

7.1.4 Asset Ownership

This section examines the ownership of different types of assets to understand the economic realities of the surveyed households. On average, households in Nyarugusu owned more livestock than their counterparts in Mgusu: in Nyarugusu, around 35% of all surveyed households owned at least either a chicken, a guinea fowl or a duck, while in Mgusu only 17% of all surveyed households did. In Nyarugusu and Mgusu 28% and 11% of households, respectively, owned at least one goat. Moreover, 12% of all households in Nyarugusu, but only 3% in Mgusu, owned a cow. Note that the value of these animals differed. While a cow cost around TZS150,000–TZS200,000 at the time of fieldwork, a goat was worth roughly TZS40,000. Moreover, the most widespread means of transportation was the bicycle, while the most prevalent consumer item was a radio. In Nyarugusu and Mgusu, 44% and 34% of surveyed households, respectively, owned a bicycle. In Nyarugusu around 14% and only 4% owned a motorcycle or a car, while in Mgusu other means of transportation were absent. In Nyarugusu, roughly 58% of sampled households owned a radio compared to 49% in Mgusu. Moreover, 28% in Nyarugusu owned a television, while in Mgusu 15% possessed a television. Table 7.10 presents these findings.

Households in Nyarugusu Ward owned on average 1.55 acres of land, whereas the average household in Mgusu Ward held 0.64 acres. This disparity has implications. First, many households were not able to grow any of their own food and instead had to buy staples at the market. As mentioned before, while in Nyarugusu own-account agriculture was a vital part of a variety of livelihood activities, this was not the case in Mgusu. There, space is limited, as the valley is surrounded by steep hills and the land is less fertile as the soil has a high clay content and is rocky. Consequently, respondents repeatedly reported having to travel 10-12 kilometres to agricultural land, which was given to them by the government. Nyarugusu Ward, however, is a widespread and geographically dispersed rural ward where virgin and good quality farming land is available. Consequently, a contrasting reality emerged: on the one hand, there was a scarcely diversified local economy in Mgusu Ward; on the other hand, a greater bandwidth of economic activities existed in Nyarugusu Ward.

Table 7.10

Household Assets by Location

	Nyarugusu			Mgusu		
	Average	SD	%	Average	SD	%
Livestock						
Cattle	1.2	5.09	12.00	0.14	0.85	2.86
Goat	1.74	3.87	28.00	0.4	1.49	11.43
Sheep	0.18	1.06	4.00	0	0	0
Poultry	3.08	6.67	35.20	2.31	7.03	17.14
Other livestock	1.11	3.39	17.60	1.77	5.77	20.00
Consumer items						
Car	0.04	0.20	4.00	0	0	0
Motorcycle	0.15	0.40	13.60	0.03	0.17	2.86
Bicycle	0.61	0.90	44.00	0.34	0.48	34.29
Radio	0.71	0.71	58.40	0.62	0.77	48.57
TV	0.34	0.58	28.00	0.34	0.68	15.71
Running a shop						
Shop	0.18	0.60	13.60	0.03	0.17	2.86
Food service	0.04	0.19	4.00	0.03	0.17	2.86
Bar/Brewery	0.32	0.17	3.20	0.06	0.23	5.71
Other business	0.10	0.31	10.40	0.31	0.47	31.43

Note. Source: Own data. SD = Standard Deviation.

Table 7.11 depicts assets by incomes. Consumer items such as a car, motorbike, and tv were positively correlated with incomes. In Nyarugusu, 33.3% of wealthy households and 26.5% of low-income households owned a goat. Moreover, 22.2% of all affluent households and 12% of low-income households possessed a cow there. Thus, a higher income made it more likely to own large livestock. With respect to consumer items, the following findings emerged. In Nyarugusu, a third of wealthy households owned a car, 44% a motorbike, and 77% a TV. In contrast, across households with a low income, only 2% owned a car, 9% a motorbike, and 22% a TV. Moreover, of all the sampled wealthy households in Nyarugusu, every household possessed a radio and 55% a bicycle. In contrast, only 51% of low-income households possessed a radio and 42% a bicycle. Thus, the differences in assets held are particularly noticeable for expensive items such as a car, a motorcycle, or a TV. This indicates that expensive consumer items are a good predictor for incomes and thus wealth differentiation.

It is also worth noting that the distribution of assets is context-specific as the data for Mgusu indicate. In Mgusu, given that land is scarce, animal husbandry was not

common as the low number of animals across different types of households indicates. Moreover, there, moto-taxis are the main mean of transportation which helps to explain the low numbers of cars and motorcycles owned, even among wealthy households. Yet, differences in assets held surfaced for goats, a TV, and even a bicycle across different income levels. Having outlined the distribution of assets, the next section discusses an asset index, and the results it yields, as an alternative to money-based poverty measures.

Table 7.11

Assets by Income Strata and Location

Income strata	Nyarugusu									Mgusu								
	Low (n=83)			Medium (n=33)			High (n=9)			Low (n=23)			Medium (n=10)			High (n=2)		
	Av.	SD	%	Av.	SD	%	Av.	SD	%	Av.	SD	%	Av.	SD	%	Av.	SD	%
Livestock																		
Cattle	1.01	4.48	12.05	1.55	6.09	9.09	2.67	6.63	22.22	0	0	0.00	0.5	1.58	10.00	0	0	0.00
Goat	1.31	2.82	26.51	2.91	5.88	30.3	1.44	2.30	33.33	0.09	0.29	8.70	0.4	1.26	10.00	4	5.66	50.00
Sheep	0.05	0.35	2.41	0.24	1.00	6.06	1.11	3.33	11.11	0	0	0.00	0	0	0.00	0	0	0.00
Poultry	2.36	6.45	30.12	4.82	7.23	48.48	3.33	6.10	33.33	1.09	3.13	13.04	3.6	11.04	20.00	10	14.14	50.00
Other livestock	0.86	2.47	19.28	1.58	5.00	12.12	1.78	3.67	22.22	1.61	6.26	17.39	2.5	5.36	30.00	0	0	0.00
Consumer items																		
Car	0.02	0.15	2.41	0	0	0	0.33	0.50	33.33	0	0	0.00	0	0	0.00	0	0	0.00
Motorcycle	0.1	0.3	9.64	0.15	0.36	15.15	0.67	0.87	44.44	0	0	0.00	0.1	0.32	10.00	0	0	0.00
Bicycle	0.59	0.94	42.17	0.58	0.75	45.45	0.89	1.05	55.56	0.30	0.47	30.43	0.4	0.52	40.00	0.5	0.71	50.00
Radio	0.58	0.61	51.81	0.85	0.8	63.64	1.44	0.73	100.00	0.65	0.83	47.83	0.6	0.70	50.00	0.5	0.71	50.00
TV	0.27	0.52	22.89	0.27	0.45	72.73	1.22	0.83	77.78	0.30	0.56	26.09	0.4	0.97	20.00	0.5	0.71	50.00
Running a shop																		
Shop	0.1	0.3	9.64	0.09	0.29	9.09	1.33	1.66	66.67	0.04	0.21	4.35	0	0	0.00	0	0	0.00
Food service	0.05	0.22	4.82	0.03	0.17	3.03	0	0	0	0.04	0.21	4.35	0	0	0.00	0	0	0.00
Bar/Brewery	0.01	0.11	1.20	0.09	0.29	9.09	0	0	0	0.04	0.21	4.35	0.1	0.32	10.00	0	0	0.00
Other business	0.12	0.33	12.05	0.61	0.24	6.06	0.11	0.33	11.11	0.22	0.42	21.74	0.5	0.53	50.00	0.5	0.71	50.00

Note. Source: Own data. SD = Standard Deviation. % share of households owning respective asset. Averages across households who owned the respective asset.

7.1.5 Asset Index

The next paragraphs pay close attention to Johnston and Abreu (2016) who provide a set of recommendations concerning asset indices. First, an asset index ought to cover a limited timeframe and a defined spatial area. The more heterogeneous time and space are, the greater the impact of variables which are not helpful in explaining wealth might be. Second, the assets in the index should be based on a local and relational understanding of wealth and deprivation. Relational means choosing items, such as owning valuable livestock (e.g., a cow), which are well enough correlated with local wealth differentiation. Table 7.11 shows that, across both sites, a higher income is strongly correlated with possessing more expensive assets such as a car or a cow. In this sense, the assets chosen ought to reflect the "kind of wellbeing to be measured" (p. 418). In this thesis, assets are thus analysed as a proxy for income.

This research constructed the asset index in the following steps. First, assets and services were selected by following works applying DHS data (Howe et al., 2012; Sahn & Stifel, 2000). To construct asset indices, authors working with DHS consider the ownership of distinct consumer durables (such as a television, motorcycle, car), a household's dwelling characteristics (such as the type of walls, floor, and roof), and access to services (such as electricity and drinking water). Following their practice, Table 7.12 provides an overview of the items selected for the index.

Second, specific weights were assigned to each item by using Principal Component Analysis (PCA). Weights were computed by searching for not immediately observable patterns in the underlying data structure (Johnston & Abreu, 2016). At the same time, these patterns do not reflect the directly visible ownership of assets. PCA was initially designed to aggregate information "scattered in many numeric measures" (Kolenikov & Angeles, 2009, p. 129) and its underlying idea is to compute a measure of correlation between these factors or components and the respective variable (Johnston & Abreu, 2016).[134] In the pool of variables in Table 7.12, some are binary – such as owning a car, while others are ordinal – such as the water source of a household. For ordinal variables, different types of answers exist: for example, sources of water might be (1) piped, (2) a protected private well, (3) a protected public well, or (4) an

[134] Applying PCA, factor or multiple correspondence analysis yields usually quite similar results (Johnston & Abreu, 2016; Michelson et al., 2013).

Table 7.12

List of Assets

Asset	Indicator
TV ownership	Dummy=1 if yes; 0 otherwise
Car ownership	Dummy=1 if yes; 0 otherwise
Motorcycle ownership	Dummy=1 if yes; 0 otherwise
Bicycle ownership	Dummy=1 if yes; 0 otherwise
Radio ownership	Dummy=1 if yes; 0 otherwise
Improved roof	Dummy=1 if iron sheets, tiles, asbestos; 0 otherwise
Unimproved roof	Dummy=1 if thatch grass, mud; 0 otherwise
Improved walls	Dummy=1 if bricks (baked or cement); 0 otherwise
Unimproved walls	Dummy=1 if mud and poles; 0 otherwise
Protected private well as source of drinking water	Dummy=1 if yes; 0 otherwise
Protected public well as source of drinking water	Dummy=1 if yes; 0 otherwise
Unprotected source of drinking water	Dummy=1 if well, spring, dam, lake, etc; 0 otherwise
Electricity	Dummy=1 if yes; 0 otherwise
Modern latrine	Dummy= 1 if flush toilet or concrete latrine; 0 otherwise
Non-concrete latrine	Dummy= 1 if non-concrete pit latrine; 0 otherwise
No toilet	Dummy =1 if yes; 0 otherwise

Note. Source: Own data. Piped water was not included as a dummy variable as no household reported such drinking water source.

unprotected source. To incorporate these categories into the PCA methodology, Filmer and Pritchett (2001) propose dummy variables for each category to circumvent the problem of having non-monotonic variables. This research followed their recommendation and dichotomised all ordinal variables.

Third, running a PCA in a statistical software package yielded the weight of each variable for the first principal component. These weights are displayed as factor scores in Table 7.13. The factor scores indicate the effect of a variable on a household's asset stock. The higher a positive factor score, the more likely it is that a household scores highly on other indicators correlated to high levels of material wellbeing. The largest positive coefficient is linked to owning a modern latrine. Thus, households with a modern toilet are likely to score highly on other assets linked to material wellbeing such as being connected to the public grid, owning a car, a TV, or a motorcycle. At the

Table 7.13

Results From First PCA

Variable description	Mean	SD	Factor score
TV ownership	5.63%	.2311	0.2816
Car ownership	3.13%	.1745	0.2960
Motorcycle ownership	1.25%	.1115	0.2006
Bicycle ownership	41.88%	.4743	–0.0334
Radio ownership	56.25%	.4976	0.1520
Improved roof	97.5%	.1566	0.1606
Unimproved roof	1.25%	.1115	–0.1560
Improved walls	85.63%	.3519	0.2442
Unimproved walls	6.88%	.2538	–0.1785
Protected private well as source of drinking water	48.13%	.5012	0.0491
Protected public well as source of drinking water	19.38%	.3965	0.2570
Unprotected source of drinking water	30.00%	.4597	–0.2722
Electricity	12.50%	.3318	0.3449
Modern latrine	34.38%	.4765	0.4376
Non-concrete latrine	58.13%	.4949	–0.4169
No toilet	6.25%	.2428	–0.0150
Largest eigenvalue	2.95196		
Proportion of variance explained	0.785		

Note. Source: Own data. SD = Standard Deviation.

other end of this spectrum, a household with a non-concrete latrine is more likely to also be deprived of other services and assets.

As a last step, the index as an estimate of wealth was calculated by applying the factor scores as weights. To account for negative index values, it is common practice to shift the distribution by exactly the amount required for all values to be larger than zero (Booysen et al., 2008; Sahn, 2003). As the lowest index value was – 4.17, this number was added to exclude all negative values. Despite the index's changed mean, its variance stayed the same. Calculating the Pearson correlation coefficient yielded a statistically significant negative correlation between the asset index and food (–0.21) and basic needs (–0.15) poverty.[135] Note that even though this indicates that higher poverty rates are linked to lower levels of assets, the correlation coefficient is weak, indicating that households defined as income poor are not necessarily asset poor. As a

[135] Both poverty lines are based on reported incomes. The correlation coefficients for food and basic needs poverty based on expenditure data are slightly higher, sitting at –0.26 and –0.24 for basic needs and food poverty, respectively.

next step, relative poverty lines at 40% and 60% were introduced. To calculate the lines, the highest individual index of a household is considered to represent 100%. Subsequently, cut-off lines representing 40%, and 60% of this value were defined. The relative asset poverty lines represent the fraction of households that have an asset index value below the respective line. Table 7.14 yields a number of findings.

First, asset poverty in Nyarugusu Ward is higher than in Mgusu Ward. In Nyarugusu, 35% of all households were living in poverty assuming a poverty line of 40%, whereas in Mgusu for 25.7% of all households this was the case. Looking at the most rigid poverty line of 60%, the relative increase in percentage points is substantial. In Nyarugusu 68% of all households and in Mgusu 54.3% were considered to live in poverty. With respect to the distribution of poverty, this might imply that households in Nyarugusu are more scattered around the 40^{th} to 60^{th} percentile compared to Mgusu. Again, location has a marked discriminatory function; the above reinforces the findings on money-based poverty, which similarly suggested that in Nyarugusu more people are living in poverty than in Mgusu.

Second, the asset-based poverty index suggests a stronger degree of deprivation than the previously discussed money-based poverty measures. The latter reported basic needs poverty rates of 47.3% and 36.7% for Nyarugusu and Mgusu, respectively, whereas the asset poverty rate at the 60% poverty line was 68% and 54.3%, respectively. This discrepancy might point to a more structural, medium-term level of deprivation that is not captured by flow variables such as income and expenditure. Yet, it is important to acknowledge that the ownership of assets may be affected by other factors than household wealth. One example might be specific norms of consumption which differ across villages shaped, for instance, by the cultural fabric of these settlements (Johnston & Abreu, 2016). Some have argued that assets with a high durability, such

Table 7.14

Asset Poverty Lines by Location (%)

	Total	Nyarugusu Ward	Mgusu Ward
40th percentile poverty line	35.0	37.6	25.7
60th percentile poverty line	65.0	68.0	54.3

Note. Source: Own data. Both the 40^{th} and the 60^{th} percentile poverty line are conventionally used in the poverty literature (Booysen et al., 2008).

as bicycles, might mirror increases in incomes better than dwindling incomes (Booysen et al., 2008). Yet, this might be cushioned by the sale of assets at times of economic hardship.

To conclude, the different types of poverty measures have added differently to the analysis. First, deploying basic needs and food poverty lines allowed comparison of the situation in 2019 to the 2004 findings. The analysis found that both forms of poverty remained high at both sites, with female-headed households in particular being affected. Mining households in Nyarugusu were characterised by higher poverty rates than their non-mining counterparts. By contrast, in Mgusu, where over 90% of surveyed households engaged in ASGM, poverty rates are lower. This indicates that location, and differences in local economies, affect the outcomes of ASGM activities on poverty and poverty reduction. At the same time, it motivates a deeper analysis of ASGM labour markets.

Second, constructing an asset index revealed a more comprehensive picture of the situation. The finding that asset indices are higher than the degrees of poverty found through applying income poverty lines, highlights that many households lack assets to cushion them in times of hardship. This structural dimension is important as it helps to explain how and why, households are able, or unable, to react to their exposure to shocks. Regarding this prevalence of shocks, we have learned that households in Mgusu are particularly exposed to food shortages, whereas sickness and low mineral prices were experienced at both sites. The analysis now shifts to a qualitative analysis of poverty to triangulate these findings and also to understand spatial differences more thoroughly.

7.2 Adding Meaning: Qualitative Evidence on Poverty

We have seen that different metrics indicate different impacts of ASGM on households. Section 7.1.1 outlined the deficiencies of money-based poverty lines in *explaining* the dynamics behind ASGM's impact on poverty. To explore the respective dynamics translating into poverty reduction (or not), this research generated qualitative evidence through interviews and drew on it for its analysis. In so doing, the aim is to voice ASGM workers' perceptions of how the sector has, or has not, helped them in escaping poverty to complement previous quantitative evidence. What are their

subjective, lived, experiences with regard to poverty and how do they link these to ASGM? To what degree do they contradict or corroborate quantitative indicators?

Before discussing to what degree poverty reduction through ASGM surfaced during the interviews with ASGM workers, this section first analyses how respondents defined development and thus poverty reduction.[136] The following interview extracts give a first impression. A male respondent in Nyarugusu described his situation: "I do not own a means of transportation; my children are studying in a local school. I am still living in poverty" (interview with Digger 10, 2019). Another respondent, comparing his situation to that of his peers, noted "some miners have a better life than me because some of them have better houses and cars, and they are able to send their children to nicer schools than I do. I have made no progress; I have only built this small hut I currently live in" (interview with Digger 3, 2019). A further respondent in Mgusu described the ways in which he thought ASGM activities had lifted him out of poverty: "Through mining activities, I have expanded my income sources. I was able to build a house, and to send my children to a good school. I have enough money to help my family in the case of health issues and my family is eating well. So now I am beyond the poverty line, and I thank God for that" (interview with Sponsor, 2019). The latter quote outlines how he successfully managed to diversify and to climb the occupational ladder of ASGM in Mgusu, whereas the previous quotes by Digger 3 and Digger 10 explain what is associated with development and why it is considered to have "made no progress" (interview with Digger 3, 2019). Summarising the above, most respondents understood personal economic development as associated with being able to save, to diversify their income sources, and/or to accumulate tangible assets. Likewise, many respondents highlighted that accessing better public infrastructure, sending their children to a good school, and providing better food meant improvements in life for them.

Having outlined how respondents defined development, next we examine how respondents considered ASGM's impact on them. Analysing the interviews with ASGM workers, two distinct questions emerged. First, to what degree ASGM allowed a living at the subsistence level and, second, to what degree it helped respondents to escape poverty. The analysis begins with the former. Generally, many respondents stated that ASGM incomes allowed them to cover daily consumption expenses such as

[136] See Appendix D for the list of interviewees.

being able to provide food for their families. A female stone crusher stated, "whatever amount I earn from my activities is used to provide food for my family and some of it is used to buy school uniforms and other school needs for my children" (interview with Crusher 3, 2019); a fellow female crusher added "I usually get something to support my living" (interview with Crusher 2, 2019). Another respondent, a male miner from Nyarugusu, described his situation as mixed: "I only get small amounts which we use only for family consumption; and it is not enough because sometimes we go to sleep hungry. Life is very tough in mining areas. We do not get money to improve our living standards, we only get money to buy food" (interview with Digger 3, 2019). These quotes underline that during the interviews most respondents stated that ASGM allowed them to subsist but not improve their economic situation more sustainably; this leads to the second question of what impact respondents attributed to ASGM with respect to poverty.

Overall, the miners interviewed were sceptical about the sector's ability to lift them out of poverty. The majority (16 out of 23 respondents) stated that ASGM had not helped them to escape poverty. Again, locality matters. In Nyarugusu, 11 out of 16 interviewees reported that ASGM activities had not translated into escaping poverty, while in Mgusu five out of seven stated that, despite engaging in ASGM activities, they were unable to escape poverty. Next is examined the perceptions and reasoning of these miners.

First, 75% of respondents, who stated that the sector had not lifted them out of poverty, felt that ASGM incomes were too low to improve their situation structurally. In this regard, a female crusher concluded that ASGM had "not helped me to escape from poverty because what I usually get is spent on daily consumption within the household" (interview with Crusher 2, 2019) while a respondent in Nyarugusu added, "I only earn very small amounts" (interview with Stone Trader, 2019). These stories of low incomes are complemented by the account of a male digger in Nyarugusu who, even though his ASGM income sufficed for family consumption, struggled to send his child to secondary school:

> Most miners are in a poverty cycle because we get very small amounts of money that we end up using for family consumption and, to be honest, with the income we earn from this activity we cannot get out of poverty anyhow … For example, here at my household I have school-age children … there are some costs to pay at their schools but sometimes, I fail to pay those costs because I do not have

> money. One of my sons … is expecting to join Form 1 [primary school] in January, but I do not have money to cover the costs. I keep on thinking daily 'where will I get the money to send him to school?' (Interview with Digger 12, 2019)

These different quotes reiterate that incomes were often too low to escape poverty but high enough for daily subsistence, as outlined previously.

Many respondents regarded the volatility of ASGM incomes as a reason for these low (overall) incomes. In particular, miners digging on their own could do so for a long time without earning anything. These periods of non-productivity created dependency on intermittent income sources as neatly summarised by a miner in Nyarugusu:

> Mining activities have not helped me to move out of poverty because you may come home from work with TZS100,000 or more but at the same time you have spent one or two weeks feeding your family through a loan. So, when you get that money, you have to pay back the loan first and you may be left with TZS40,000 with which you have to buy food to support the family for four or five days … Sometimes you may go back asking for a loan after those days have passed and you end up with nothing. (Interview with Digger 9, 2019)

This respondent described that even though, after two weeks of digging he had struck gold yielding TZS100,000, he had to use 60% of this income to repay a sponsor who had lent him money. The remaining 40%, TZS40,000, would only be enough to sustain his family for a short time and so he continued to search for additional income sources. The quote also highlights that sometimes no gold is found but the debt remains. A second account by a respondent in Mgusu reiterates that self-employed workers might go without striking gold for a long time: "Remember, you have spent like six months taking money from different people to provide for your family and you have to pay back the loans" (interview with Ex-chairmen of Mgusu Miners Association, 2019). Thus, given these long periods without a secure income, self-employed diggers had to rely on loans from others.

The conditionalities attached to these informal loans often put miners in a vulnerable position. At both case study sites, respondents stated that local middlemen finance ASGM activities before they reach the stage of production. One respondent described that, "apart from transportation money, he [the sponsor] also gives me money to solve my family problems so, he helps me a lot and I give back his money when I

get gold because I have to sell the gold to him; he has the right to buy my gold first" (interview with Digger 13, 2019).[137] Various respondents confirmed that such sales occurred at prices below market rates: "They also used to buy our minerals at low prices like TZS30,000 for 12g of gold while at the market people sell 12g of gold for TZS120,000" (interview with Digger 7, 2019).[138] Thus, advance sales linked to these loans rendered this group of miners more vulnerable.[139]

Respondents relied on informal credit not only because of ASGM's income volatility but also because they did not have the capital needed to finance a pit until it produces. One respondent, digging on his own, emphasised that "Mining activities have not helped me to reduce poverty because I started mining using the small resources I have because I did not have working capital … In my opinion, it is only the lack of working capital that is stopping ASM from getting us out of the poverty" (interview with Digger 10, 2019). Another respondent noted that he did not have "enough capital to practice modern mining activities" and added that he still used "very basic equipment like pickaxe, hammer, etc. We also do not have a gold detector, we just guess" (interview with Digger 14, 2019). This was echoed by others (see, for instance, interviews with Crusher 1 and Pit Owner, 2019). The statements reinforce the argument that due to a lack of capital, most miners, while establishing a new pit, had to rely on external income sources and rudimentary tools.

These high levels of insecurity are strengthened by the fact that respondents were unable to diversify their income base. One interviewee stated, "Mining activities have not helped me to really escape from poverty because apart from these mining activities I do not have any other tangible project which generates income for me on a daily basis" (interview with Digger 12, 2019), while another added "I do not have any other business because of a lack of capital" (interview with Crusher 2, 2019). The owner of a crushing machine in Nyarugusu concurred with this view, noting that "ASM has not helped me to escape from poverty because you cannot depend 100% on mining which works like betting where people may lose or win. And that's why most of the miners in Nyarugusu are still poor …Very few people have … managed to escape from

[137] This narrative by miners was corroborated by an interview with a local sponsor.
[138] The respondent referred to 12 gram as this is more or less equivalent to 1 tola, which is a traditional Indian weight unit, equivalent to 11.7 grams, indicating the traditional dominance of Indian-Tanzanians in the business of trading gold (Jønsson & Fold, 2009).
[139] Section 8.4 analyses the role of informal finance with respect to labour market outcomes in more detail.

poverty … In our village [Nyarugusu], of around 15,000 people who are miners, only 50 have managed to escape from poverty" (interview with Crushing Machine Owner, 2019). A third respondent noted, "you must have a stable business that provides you with a daily income. If you have diversified your economy and you are not depending only on digging, you will be able to reduce poverty. In our area this can be done by building guesthouses, or any business that will allow you to earn a daily income" (interview with Digger 8, 2019). This view was echoed by respondents who had been able to diversify their income-generating activities: "My wife helps me a lot to feed the family because she runs a small business, and this is where we get money for family uses on a daily basis" (interview with Digger 14, 2019); and "To be honest, mining activities have not helped me a lot. That is why I am now engaging a bit in farming activities so that I can increase my income" (interview with Stone Trader, 2019). To conclude, all emphasised that, given the sector's income volatility, a daily and regular non-ASGM income is an important pathway to reduce poverty.

To unpack further what respondents perceived as the positive role of ASGM in poverty reduction, the analysis shifts to the seven respondents who had managed to escape poverty via ASGM. Their reasoning can be divided into three main aspects. First, through their ASGM incomes miners were able to cover their basic needs and to invest in their children's education. For these respondents, covering basic needs meant being able to afford food and clothes (interview with Digger 2, 2019), to "send my children to a good school" and to support household members "in the case of health issues" (interview with Sponsor, 2019). Second, they perceive ASGM as poverty-reducing as it had helped them to acquire tangible assets such as "a plot [of land] and to build a house" (interview with Supervisor, 2019), "a farm and some cattle" (interview with Digger 8, 2019), "a bicycle" (interview with Digger 2, 2019), or "beds, mattresses, and a table" (interview with Digger 1, 2019). Last, they were successful because they had managed to diversify their incomes by establishing "a shop selling clothes as a second income source" (interview with Supervisor, 2019), by buying "goats, chicken, and ducks … or a sewing machine" (interview with Digger 1, 2019).

Having discussed respondent-based perceptions of how ASGM had improved their situation, or not, the presented evidence translates into a number of findings. On the one hand, engaging in the sector allowed most respondents to maintain a subsistence level, i.e., they were able to cover food expenses and sometimes to send children to school. On the other hand, for the majority of respondents, engaging in ASGM did not

help to reduce poverty. The main reasons why the sector's poverty-reducing ability was perceived as limited were that ASGM incomes were not sufficiently high to escape poverty structurally and were volatile. Incomes were perceived to be insufficient – in the words of many respondents – to develop. By this, miners referred to their inability to improve their living standards through mining activities in the medium term in terms of access to better infrastructure such as sending children to better schools and acquiring tangible assets. Moreover, lack of capital was perceived as a further impediment to poverty reduction, as ASGM workers had to rely on loans from local middlemen conditioned on advance sales of minerals at below market rates.

7.3 Conclusion

This section combines the chapter's quantitative and qualitative findings and links them to previous findings by scholars. Examining the quantitative data has shown that quantitative poverty measures at both settlements remain high and, in fact, slightly increased from 2004 to 2019: food poverty and basic needs poverty increased by six and eight percentage points, respectively. An assessment of poverty in the area based on an asset index highlights that assets, to insure against financial shocks and ill-health, are scarce and that many households living in monetary poverty are also asset poor. Yet, the degree of poverty differs substantially between both study sites. In Nyarugusu, quantitative figures were higher than in Mgusu. The lower poverty rates in Mgusu echo previous findings by Fisher et al. (2009) who argued that, "households were more likely to have expenditure below that needed to meet their basic needs if they lived outside Mgusu" (p. 35). Moreover, households which are structurally disadvantaged, such as female-headed households, are more likely to be in poverty. Adding to the fact that the level and nature of poverty is also affected by a household's location, this research also found that the poverty-reducing capacity of ASGM is equally dependent on where a household is located. In Nyarugusu, mining households are characterised by slightly higher (three percentage points) poverty rates than non-mining households. Contrasting this finding, in Mgusu, where over 90% of surveyed households engaged in ASGM, poverty rates are lower overall. Previous research in the same area in 2004, found that mining respondents in general were less likely to live in poverty (Fisher et al., 2009).

Adding to these quantitative findings, the chapter examined qualitative evidence on ASGM's impact on poverty. During the interviews, the majority of respondents (16

out of 23) stated that ASGM incomes allowed them to cover the expenses of basic subsistence but that ASGM has not helped them to escape from living in poverty. The chapter analysed three main reasons behind this. First, many respondents – 12 out of 16 – reported that incomes are low and this prevents them from 'climbing up the ladder' and improving their socioeconomic status. Second, incomes are volatile, leading to high levels of economic insecurity. For this reason, many respondents highlighted the need to diversify their income source but also their inability to do so. Third, respondents relied on local and informal sources of finance to be able to engage in self-employed digging. In return, local sponsors had first refusal to buy whatever gold they might find at below-market prices. This conditionality of informal finance reinforced existing inequalities.

A few words on potential bias are needed. As outlined in Chapter 3, this research conducted a household survey during the dry season and qualitative interviews at the beginning of the wet season. Interviewing during the wet season could have translated into an overestimation of rural poverty as, during this time of the year, many rural households are struggling to make ends meet (Chambers, 1983). Although ASGM activities did not fluctuate substantially between dry and rainy season, incomes might have been higher during dry season. Contrasting these possibly overreported incomes, interviewing during the wet season combined with a reference period of 12 months, helped to balance this out.

Table 7.15 presents the qualitative and quantitative findings jointly. In so doing, this research aims to juxtapose the quantitative category of 'food poverty' with the qualitative category of 'basic subsistence', and the quantitative category of 'basic needs poverty' with the qualitative category of the 'ability to develop and thus to escape poverty'. Even though this comparison has limitations, such as to what degree a money-metric measure of basic needs can be compared to respondents' perceptions of how an ASGM worker escapes poverty, this research aimed to jointly present the results. With respect to the degree of inference of both methods, the following arises. First, looking at food poverty, the qualitative data expanded the survey data by examining respondents' views on their situation, as discussed earlier in this chapter. Second, on basic needs poverty, the interviews allowed an analysis of the transmission mechanisms that did, or did not, translate into poverty reduction.

Table 7.15

Poverty Dynamics at Both Sites: Quantitative, Qualitative, and Mixed Methods Inference

Quantitative evidence	Qualitative findings	Mixed methods inference
Food poverty: 32%	*Basic subsistence*: 16 out of 23 interviewed ASGM workers reported that ASGM allowed them to provide food.	*Expansion:* Qualitative data enriched quantitative data by adding the perceptions of respondents.
Basic needs poverty: 43%	*To develop to escape poverty*: 16 out of 23 ASGM workers interviewed reported that ASGM did not help them to escape poverty due to an inability to acquire assets, to send their children to better schools, to provide for sick family members, or to access better quality infrastructure. Thus, qualitative evidence conveys that structural poverty prevails.	*Light discordance:* Qualitative data enriches the 'mechanical' basic needs poverty line which does not reflect if individuals are actually able to translate incomes above the basic needs poverty line into higher levels of wellbeing.

Having highlighted these different types of information stemming from qualitative and quantitative research, the chapter contains a methodological lesson with regard to combining methods for poverty research. By interviewing ASGM workers, the chapter reported that, for most respondents, escaping poverty meant being able to meet basic household needs such as sending their children to a good school and accessing quality infrastructure. In contrast, we have seen that the basic needs poverty line added an additional faction of income to the food poverty line, assuming that households were able to meet the broader needs outlined in the qualitative assessment. However, the quantitative measure does not assess if households which qualify as non-basic needs poor are actually able to access better quality infrastructure in reality. Here, qualitative poverty research showed that, for a majority of respondents, this was not the case.

The thesis drew on qualitative interviews to show that ASGM workers continuously faced structural obstacles such as their inability to access services and the high degree of economic uncertainty linked to ASGM activities. The high levels of perceived vulnerabilities by respondents indicated that many households, despite having incomes which allowed them to consume at a basic subsistence level, perceived their situation as insecure. The marked stratification of assets among low and high income households also points to this reality. To conclude, adding a qualitative dimension to different types of quantitative measures helped to map the complex situation at both study sites.

It is interesting to triangulate the findings on poverty dynamics with the wider ASM literature. Empirical studies have established that ASM activities have a positive effect on local households' living conditions (Bazillier & Girard, 2017; Hilson, 2002a; Pokorny et al., 2019). At the same time several contributions underline that ASM workers are not able to accumulate enough savings to escape poverty (Hilson & McQuilken, 2014; IGF, 2017). My findings are consistent with Mwaipopo et al.'s (2004), and Fisher et al.'s (2009) argument that in Nyarugusu and Mgusu "poverty was directly related to a lack of money to sustain basic needs, and especially food security" (p. 32). My evidence expands their argument by underlining that sectoral incomes were perceived by many respondents as too small to reduce poverty, which raises questions about ASGM's distributional patterns.

At the same time, as discussed in Section 2.4, ASM incomes in Tanzania are reported to be significantly higher than NFRE incomes. This raises further questions regarding how these incomes were computed and which types of ASM activities they cover. Both distributional and methodological questions motivated the subsequent chapter. As argued throughout this thesis, understanding ASGM labour markets in more detail hones our understanding of distributional outcomes. To this end, the next chapter links the analysis of poverty to the structure of ASGM labour markets at both case study sites. It scrutinises the structural specificities of both ASGM labour markets, examines the income levels of distinct ASGM jobs and employment types and embeds this into a political economy analysis.

8 The Missing Link: How ASGM Labour and Its Markets Affect Poverty Outcomes

> While you are waiting for your pit to become productive, where do you get the money for covering other family expenditures? You also dig in a pit, unsure of its gold production … it's a gamble. So many of us decide to take jobs at productive pits because we do not have any capital. We need quick money to live on.
>
> Interview with Digger 11, 2019

> I will never forget when in 2013 we managed to get 300 grams [of gold]… and gave it to Martin [a local broker] to sell it at the Geita market. Back then, the price was TZS70,000 per gram, but … he called us, arguing that people would only pay TZS50,000 per gram. We had no choice, so we agreed to sell for that price because he had sponsored us from the beginning and we had borrowed from him for a long time.
>
> Interview with Digger 1, 2019

This chapter analyses structure of ASM labour markets and their effect on households through two complementing analytical layers. First, it scrutinises the prevalence of self, waged, or hybrid forms of ASGM employment and the reasons for engaging in any one of them. In so doing, it challenges the orthodox claim of thin rural labour markets and of self-employment as dominant in ASM. To obtain a more thorough understanding of the dynamics at play, it not only examines labour survey data but also qualitative evidence. As highlighted by the first quote, it analyses how and when workers choose between waged work and self-employment, and sometimes combine both. Second, the chapter focuses on analysing the income patterns of particular ASGM jobs and employment statuses and links them to the broader political economy. To this end, it explores the heterogeneity of incomes linked to ASGM jobs and subsequently draws on Bernstein's (2007, 2010) concept of the 'classes of labour'. By mapping out different classes of ASGM labour, the chapter argues that self-

employed ASGM workers sell their labour power when they lack substantial assets and thus are best described as disguised waged workers. In existing ASM literature, small-scale miners are implicitly assumed to be self-employed, yet the empirical base of this claim is absent. Empirically examining the boundaries of classes of ASGM labour, the chapter argues that a worker's employment status affects their bargaining position. This empirical knowledge is needed to craft labour market policies as well as poverty reduction schemes.

The set of questions raised in Section 0 remains relevant. Are rural ASM labour markets, as an important dimension of non-farming labour transactions, characterised by similarly high levels of waged activities as reported by case studies on agricultural labour markets? What do employment statuses in context-specific ASGM labour markets, as an example of NFRE, look like? What is the profile of workers for each different job and what are their incomes dependent upon? How does waged and self-employed work translate into economic, and ultimately social, differentiation? Addressing these questions is essential to a broader analysis of power dynamics in ASM labour markets and their impact on household poverty and vulnerability.

The structure of the chapter is as follows. It begins by examining the prevalence of different employment statuses and then draws on qualitative interviews to scrutinise the reasons why respondents engage in waged, self-, or hybrid ASGM employment. Next, the chapter examines PSAs as well as their specificities in both ASGM labour markets, and then analyses the ways in which different jobs and employment statuses yield distinct incomes and the gendered nature of ASGM labour markets. Subsequently, it brings these findings together by applying the concept of classes of labour. It also analyses the role of informal finance, exploring how dependency on local middlemen, linked to the lack of capital in the sector, affects incomes, as suggested by the second quote above. To conclude, the chapter links the findings on ASGM labour to the analysis of poverty dynamics.

8.1 **ASGM Employment Statuses**

We have seen in Chapter 2 that context-specific case studies report much higher levels of waged labour than official labour survey data suggest and that this contrast is based on a mix of methodological shortcomings as well as a failure to consider the local context. The labour modules of these general purpose surveys apply a binary

understanding of waged vs self-employed income activities which does not take into account that workers might pursue both activities and that they are not mutually exclusive on the household and individual levels. To account for this, my research rejects a binary understanding and adds a third employment status, a 'hybrid' strategy characterised by combining periods of waged and self-employment. Applying these categories, the following evidence emerged.

8.1.1 The Prevalence of Different Employment Statuses and Mixed Strategies

Overall, in three-quarters of all surveyed households at least one member had engaged in ASGM over the 12 months prior to the survey. Across these households waged labour was high; two-thirds engaged in waged ASGM activities in the 12 months prior to the survey. Table 8.1 maps out different employment statuses for the total sample as well as disaggregated by location. Across the full sample, 30% of ASGM households were pursuing waged ASGM labour only, meaning that at least one household member had engaged in waged ASGM activities in the 12 months prior to the survey. The share of waged activities is even higher when considering households who had deployed a mixed strategy of waged and self-employed ASGM labour. Applying this broader definition, 67.5% of the surveyed households pursued waged activities in the 12 months prior to fieldwork. At the other end of the spectrum, 33.1% were engaged in self-employment only. Adding self-employed ASGM households to the ones pursuing a hybrid strategy, 70% were ASGM self-employed in the 12 months prior to the survey.

Table 8.1

Prevalence of Employment Statuses Across ASGM Households by Location

	Total		Nyarugusu		Mgusu	
Employment status	%	cum.	%	cum.	%	cum.
Waged only	30.0	30.0	20.7	20.7	54.6	54.6
Waged and self-employed	37.5	67.5	36.8	57.5	36.4	90.9
Self-employed only	32.5	100.0	42.5	100.0	9.1	100.0
Share of ASGM HHs in % (ASGM HHs/n)	75.0 (120/160)		69.6 (87/125)		94.3 (33/35)	

Note. Source: Own data. The reference period was 12 months prior to the survey.

A close look at the data from both settlements reveals first, the high prevalence of waged labour and, second, marked differences in the types of ASGM employment statuses prevailing in each of the two areas. In the 12 months prior to the survey, in Nyarugusu and Mgusu: 69.6% and 94.3%, respectively, of all sampled households were engaged in ASGM activities; 20.7% and 54.6%, respectively, in ASGM-specific waged labour; 36.8% and 36.4%, respectively, were pursuing a hybrid strategy of a mix of waged and self-employed labour; and 42.5% and 9.1%, respectively were self-employed. Consequently, in Mgusu 90.9% of ASGM households engaged in waged labour whereas in Nyarugusu 57.5% did so.

The reported prevalence of waged labour is significantly higher than the national data on Tanzania's rural economy indicate. Table 8.2 compares data on the prevalence of waged employment from the 2014 ILFS to the evidence from the 2019 survey. The 2014 ILFS reports 77.1% and 16% of rural households as self- or wage-employed, respectively (URT, 2014a, p. 24). In contrast, as outlined above, across both case study sites around 67% of households engaged in waged ASGM-related activities in the 12 months prior to the survey. This suggests that waged employment is significantly more common than suggested by the ILFS. Furthermore, a marked number of households adopted a hybrid strategy; around 36% pursued both waged and self-employment. A binary understanding of employment relations, as applied by the ILFS and discussed in Section 2.2, would have been unable to capture these dynamics across employment statuses.

These high levels of waged labour in ASGM mirror findings on the prevalence of employment statuses in other parts of the rural economy at both sites. Overall, in 67%

Table 8.2

Survey Findings (2019) Compared to National Data (2014) by Location (%)

	National data on rural households (ILFS)	Entire sample	Nyarugusu	Mgusu
	2014	2019	2019	
Waged	16.0	67.0	57.5	90.9
Self-employed	77.1	69.4	79.3	45.5

Note. Source: Own data. The ILFS reflect data on rural households only. The 2019 data adds up to more than 100% as households might have engaged in both employment statuses during the reference period of 12 months prior to the survey.

of our surveyed households, at least one household member had engaged in waged income-generating activities in the 12 months prior to the survey. This corroborates Mueller's 2008 research on northeast Tanzania which found that in almost 60% of surveyed rural households at least one household member was working for a wage (Mueller, 2015, p. 153). Moreover, these findings echo evidence on Rwanda and Ethiopia by Petit and Rizzo (2015) and on Senegal and Mauritania by Oya (2015). They also support previous research on Ethiopia by Cramer et al. (2014b), who found relatively high rates of waged employment ranging from 33% to 60% at three flower-producing sites. The same research project reported that the degree of waged labour in the country's coffee-growing sector exceeded 35%. Their findings highlighted that the prevalence of waged labour is high but also location specific. Data on waged labour at three Ugandan tea-producing sites reinforce the latter: at two sites, 70% and 80% of male respondents worked for a wage, while at the third, only 20% did so.

To contextualise the prevalence of ASGM employment statuses with employment characteristics in both local labour markets, this section examines employment statuses in smallholder farming at both study sites. The analysis follows the previous categories of waged, hybrid, and self-employment. To triangulate responses by farming households, we linked the question of what type of agricultural employment they pursued to the question on ownership of arable land. A household reporting no ownership of arable land can hardly engage in self-employed farming. Even though there might be the possibility of farming on public grounds or collective land, we argue that this group misreported their actual employment status.

As indicated in Table 8.3, testing for this claim, roughly 12% of farming respondents might have misreported their actual employment status. Overall, 11.7% of farming households did not hold any arable land. Consequently, 88.3% of farming households owned at least some arable land. The latter suggests, given that farming was absent in Mgusu, in Nyarugusu land pressure is relatively low. Yet, each of the group of landless households reported having engaged in own-account farming during the 12 months prior to fieldwork. This is contradictory. Consequently, Table 8.4 displays the relative prevalence of employment statuses in farming households, containing the original as well as the readjusted data set, in which landless farming households were listed as having engaged in waged activities instead.

Table 8.3

Arable Land Held by Farming Households

Cultivated Land (in acres)	n	%	cum.
0.00	11	11.70	11.70
0.125	1	1.06	12.77
0.25	3	3.19	15.96
0.50	7	7.45	23.40
0.75	3	3.19	26.60
1.00	20	21.28	47.87
1.50	7	7.45	55.32
2.00	27	28.72	84.04
2.50	1	1.06	85.11
3.00	6	6.38	91.49
4.00	3	3.19	94.68
5.00	3	3.19	97.87
8.00	2	2.13	100.00

Note. Source: Own data.

Table 8.4

Prevalence of Employment Statuses Across Farming Households by Location

	Total				Nyarugusu				Mgusu			
Dataset	Original		Adjusted		Original		Adjusted		Original		Adjusted	
Employment status	%	cum.	%	cum.	%	cum.	%	cum.	%	cum.	%	cum.
Waged only	1.1	1.1	12.8	12.8	1.1	1.1	12.4	12.4	0.0	0.0	20.0	20.0
Waged and self-employed	14.9	16.0	14.9	27.7	15.7	16.8	15.7	28.1	0.0	0.0	0.0	20.0
Self-employed only	84.0	100.0	72.3	100.0	83.2	100.0	71.9	100.0	100.0	100.0	80.0	100.0
Share of farming households	58.8 (94/160)				71.2 (89/125)				14.3 (5/35)			

Note. Source: Own data. The reference period was the 12 months prior to the survey. A household is defined as pursuing one of the three farming employment statuses, if at least one household member engaged in it during the reference period.

The main takeaway of Table 8.4 is that waged labour is less prevalent in farming than in ASGM at both sites. Looking at the original dataset, 84%, 15%, and 1% of households engaged in self-employed, both waged and self-employed, and waged farming, respectively. The adjusted data yield higher rates of waged employment. Examining the full sample, 72%, 15%, and 13% of households pursued self-, hybrid, and waged employment, respectively. Adopting the same binary understanding of Table 8.2, 28% and 87% of households engaged in waged and self-employed farming, respectively. Considering the adjusted dataset, in Nyarugusu Ward 72%, 16%, and 12% of farming households engaged in self-employed, hybrid, and waged farming activities, respectively. Again, the rates of the non-adjusted data are lower.[140]

These lower levels of waged labour in farming (whether or not the data are adjusted), are also lower than suggested by previous research in other parts of SSA. For Mauritania, Oya (2015) reports that 35% of households engaged in waged farming activities, highlighting the "use of hired labour in … many non-farm activities" (p. 37). For northwest Nigeria, Babatunde (2013) detected that around 43.6% of households participate in waged farming activities. What might be possible reasons for this?

First, limited pressure on farming land might have led to the fact that more respondents engage in self-employed farming. As outlined in Table 6.7, farming and ASGM were of equal importance in Nyarugusu Ward; 70% of households engaged in one or other, while in Mgusu, ASGM activities dominated. Across the full sample, 69% of all farming households (n=94) engaged in both ASGM and farming. Waged farming activities, which were only of importance in Nyarugusu, might be low as many households in Nyarugusu possessed arable land and thus cultivated their own crops instead of having to sell their labour. Nyarugusu, a spread out ward, has a high land to population ratio, and thus pressure on land through its population is limited. Acknowledging the context-specificity of these dynamics, in contrast, research on Ethiopia highlighted that land shortages, and thus decreasing plot sizes, pressure particularly the poorest into waged farming (Petit & Rizzo, 2015).

Second, it might be worthwhile to explore to what degree waged farming households engaged in specific types of ASGM employment. Table 8.5 shows that out

[140] We have seen in Section 6.2 that farming is of negligible importance in Mgusu as there is very little arable land in the area, combined with the fact that land is predominantly used for ASGM activities. Therefore, as only five households in Mgusu engaged in farming, we abstain from analysing the farming sector there.

Table 8.5

The Relationship of ASGM and Farming Employment Statuses (%)

Farming employment status	ASGM employment status	
	Waged	Self-employed
Waged	26.7	44.1
Self-employed	33.3	50.5

Note. Source: Own data. A binary understanding of employment statuses was applied. Only households that engaged in both ASGM and farming during the last 12 months prior to the survey were covered. n=65.

of the group of waged farming households, 26.7% engaged in waged ASGM activities and 44.1% in self-employed ASGM activities. Moreover, 50.5% of self-employed farming households were engaged in self-employed mining activities against 33.3% in waged ASGM labour. Overall, independently of their employment status in farming, households pursuing both farming and ASGM were more likely to be found in self-employed than waged ASGM activities. The reasons for this are linked to the ways in in which incomes in ASGM are linked to employment status and job, as analysed from Section 8.2 onwards. As a next step, the chapter integrates qualitative evidence to deepen the understanding of specific employment statuses and the dynamics ingrained in these.

8.1.2 The Reasons for and Dynamics Underlying Choosing Waged or Self-Employed ASGM Work

Building on the quantitative findings that waged and mixed forms of ASGM employment were frequent, this section draws on qualitative evidence to unpack the characteristics of different employment statuses as well as the reasons for engaging in waged, self-, or mixed forms of ASGM employment. To begin with, none of the miners interviewed who were working for a wage had a written work contract and all were employed informally. Moreover, until a pit reached production stage, waged diggers working there received a daily allowance of around TZS2000 (~US$1). Once the pit started to produce ore, workers received their incomes as a production share; as soon as a minimum number of bags of raw ore had been produced, they were distributed amongst the workers. The PSAs prevailing at both sites are analysed in more detail in Section 8.2.1. Processing workers received cash incomes. Thus, all types of waged workers sell their labour power as a commodity.

With regard to looking for a job, and its longevity, a female stone crusher explained that "there is no permanent place to ask for work other than going to different places and [to] ask … if they can provide employment" (interview with Crusher 3, 2019). A male digger added "usually I get employed at different pits on a daily basis" (interview with Digger 11, 2019), while a digger in Mgusu said:

> I always get employed at other's pits at Mgusu mountain. The employment there on the mountain is not permanent at one pit but every day I wake up in the morning and I go up the mountain to look for a job in any productive pit. Most of time I look for pits that are producing more than others. (Interview with Digger 13, 2019)

All three quotes highlight that workers were searching for employment possibilities on a daily basis, which indicates that waged labour is casual at both sites.

Workers' search for employment was geared towards finding work in productive pits. The following quotes highlight how waged workers consciously chose their workplace according to the productivity of a pit: "For me, usually I get employed at different pits on a daily basis and it depends on the production of those pits because it is an on and off sort of work" (interview with Digger 11, 2019); another respondent added "So, if you are digging in a pit which is not productive, where will you get money to feed your family? So, most small miners get jobs in a productive pit to make quick money" (interview with Digger 14, 2019). A further respondent added "You cannot dig at an unproductive pit. A small-scale miner wouldn't even think of it" (interview with Crusher 1, 2019).

Scrutinising the reasons for opting for a specific employment status, many respondents replied that waged employment allowed them more regular incomes than self-employment, which they needed to provide basic needs for their families. During our interviews, 10 respondents reported statements along the lines of ASGM waged labour enabling them to "make quick money to supply their families with food and to send their children to school" (interview with Digger 12, 2019), that "most miners like to be employed in already productive pits because they need quick money for family expenses" (interview with Digger 13, 2019), and that one "could be assured of getting cash at the end of the day" (interview with Digger 1, 2019). Five interviewees stated that before a pit is productive, sponsors provide a daily pay of TZS2,000 and "food during the entire extraction process" (interview with Digger 12, 2019). This information was corroborated by other interviewees (interviews with Pit Owner, Digger

8, and Digger 14, 2019). Thus, even in a situation when the pit had not started to produce, waged workers were assured of receiving a small daily income. Thus, a first reason for choosing waged employment, was that it allowed for a daily and regular, albeit low, income.

This is in contrast to self-employed ASGM activities for which respondents described income volatility as high. One miner noted: "mineral income is unpredictable. You may get money today and spend years without money because no one knows when exactly minerals will be found again" (interview with Digger 1, 2019), while another added, "some may spend three months in one pit while others go up to two years extracting at one pit and they all get nothing, not even TZS100 from their pits" (interview with Crushing Machine Owner, 2019).[141] The unpredictable nature of self-employed work was substantiated by five more interviews describing the process of mining gold as a "gamble" (interviews with Digger 9, Stone Trader, Pit Owner, and Digger 11, 2019).

Periods without incomes occur even more so during a pit's development. Our interviewees stated that developing a pit can take "six months or a year" (interview with Digger 10, 2019) and that "establishing your own pit requires money for buying equipment, food, timber, and money for family expenditures" (interview with Digger 14, 2019). For these reasons, "most people … cannot afford the running costs" (interview with Digger 11, 2019) and thus "most miners get work in already productive pits because working on your own pit requires you to have enough capital" (interview with Digger 8, 2019). Given this combination of long periods without any income and the lack of the capital required, engaging in waged ASGM activities was seen as a way to self-finance patches of self-employment as "through employment you may get money to carry on with self-employment for as long as three months without worries" (interview with Digger 10, 2019). The conflict of satisfying basic needs, and the capital and time requirements linked to self-employed digging is neatly summarised below:

> While you are waiting for your pit to become productive, where do you get the money for covering other family expenditures? You also dig in a pit, unsure of its gold production … it's a gamble. So many of us decide to take jobs at productive pits because we do not have any capital. We need quick money to live on. (Interview with Digger 11, 2019)

[141] This is triangulated by another interview (interview with Supervisor, 2019).

Equally, a mixed strategy of waged and self-employment was employed by respondents in situations of low productivity of their own mining pit: “Many miners decide to opt for waged work at others’ pits because of low production at their own pit – and people are influenced by the production output of nearby pits” (field notes, 12 March 2019). This dynamic of shifting back and forth from waged to self-employment is perhaps best described by: “You can keep digging on your own pit … without producing anything, and then you find out that the neighbouring pit is productive, so, you decide to work at your neighbour’s pit” (interview with Sponsor, 2019).

The decision to engage in self- or waged employment was further linked to the broader financial situation of a household. One respondent stated that:

> If my family can satisfy all basic needs including food, it is easy for me to be self-employed … because even if I get nothing for some days, still the family has something for survival. But if they have nothing at home I will … work at others’ pits because I am assured of having cash at the end of the day, which can be spent on family expenses. (Interview with Digger 4, 2019)

Another respondent added:

> In the past people were starting new pits because they were coming from afar, leaving their families, coming to Mgusu. So, it was much easier to set up a pit because their families were far away and not reliant on them. But now, here in Mgusu, it is not easy to start a new pit because you realise that your family depends on you and, as you know it takes a long time, like two or three years, until the new pit reaches production. (Interview with Digger 12, 2019)

Both quotes emphasise that a household’s larger socioeconomic situation shaped the workers’ decision of which employment status to opt for. They underline that, even though income uncertainty is inherent to ASM activities, miners consciously decide to opt for steadier incomes when their household is in financial need. This is vividly described by a female stone crusher in Nyarugusu:

> On top of that, other miners decide to opt for self-employment when there are other sources of income which will be used to support their family needs or when someone’s wife is engaged in income-generating activities. So, they are assured of food availability at home and other expenses unlike people who depend 100% on mining activities or people with no other sources of income. (Interview with Crusher 2, 2019)

Thus, the interplay of daily, albeit low, incomes through waged activities, a lack of finance to engage in self-employment, and a household's economic wellbeing, shaped individuals' decisions to adopt either a dual strategy of alternating between waged and self-employed activities, or of pursuing waged labour or self-employment only. Likewise, as ASGM activities prevailed in Mgusu, non-ASGM related livelihood diversification took place to a negligible degree.

Having outlined some of the dynamics with respect to waged labour and transferring to self-employed work, respondents described that they often face harsh labour conditions in an unequal playing field. A male digger in Nyarugusu noted that "employers are very oppressive … sometimes they do not share what they have obtained fairly" (interview with Digger 5, 2019), while another added "the pit owner gets more profit than the workers who get a small amount of dividends … when being employed you become like a slave. You cannot even complain about anything" (interview with Digger 11, 2019). Adding to this, a female stone crusher recounted the situation of her husband, a digger:

> For example, my husband was employed for a long time, and he was always telling me how their bosses mistreated him at work. He even complained about the payment he received compared to the work he was doing and said that he wastes his energy only to benefit others. (Interview with Crusher 3, 2019)

Her sentiments were echoed during further interviews (interviews with Digger 2 and Ema, 2019). Given that capital for self-employment is scarce, this speaks to a situation in which bargaining power is skewed towards those who provide the capital and equipment, and thus have the capacity to contract workers. Many respondents described difficulties in finding waged employment as there is an oversupply of workers. At the same time, as previously outlined, self-employment, as an alternative to waged ASGM labour, can be characterised by a substantial degree of income uncertainty which cannot be sustained for a long time given the limited abilities to cushion income shocks through selling assets and/or loans as highlighted in Section 7.1.4.

However, given the insecure working conditions of informal waged workers, working as a self-employed ASGM worker was described by some respondents as desirable – yielding higher incomes and allowing higher degrees of self-reliance. One survey respondent stated that "when you work on your own you get more money … than you get when you are employed" (field notes, 12 March 2019), while another interviewee added "I prefer to be self-employed because whatever I get belongs to me"

(interview with Digger 1, 2019). The latter quote speaks to the perception that workers felt disadvantaged when it comes to their PSA share.

Most interviewees in Nyarugusu emphasised that self-employment is perceived as a higher social status and that "there are few miners who like to be employed" (interview with Sponsor, 2019). However, this seems location specific, shaped by the financial responsibilities a respondent had to burden, and by a worker experience. One respondent in Nyarugusu opined "I think it is better to be employed because you do not waste your time and you are assured of making money" (interview with Digger 7, 2019), while in Mgusu Ward, a number of young miners preferred waged employment as they were "not sure about the gold content of that area" and "like to be employed in pits that are already productive" (interview with Crusher 4, 2019). There, another respondent added:

> If you look at us young people: for now, most of us prefer to be employed so as to get quick money to provide for our family because self-employment takes a long time to obtain something. So how can your family stay without food for all those days? This is quite different from our parents who prefer to be self-employed. (Interview with Digger 9, 2019)

As outlined in Section 2.4, previous research by Bryceson and Jønsson (2010) on southwest Tanzania has shown that the first mining site teaches young miners "how to mine", in effect an informal apprenticeship (p. 380). Mining sites are where social networks are built, a key factor to upward mobility (Jønsson & Bryceson, 2009). Linking this to my findings, it could be argued that through this first stretch of waged employment, young miners might obtain informal information for future either waged or self-employed activities. In this way, their digging experience might help to build networks.

The fact that miners change employment statuses not only when they have to, but also when they are able to do so, drawing on Bernstein (2007) and Rizzo (2017), is best described as employment decisions made on a continuum. Understanding internal differentiation across employment statuses helps to analyse the structural forces behind them. On one end of this continuum, we have seen that individuals working their own pit do so without either owning operative assets or capital and are thus reliant on external finance. Self-employed miners invest their labour power, similar to a waged worker, the only difference being that the former's share when striking gold is larger but uncertain. In the case of self-employment, rewards lie in the future and are

hypothetical, as striking an ore body rarely occurs. At the same time, these one-off rewards exceed contracted waged labour incomes and hence, many miners try their luck by digging on their own. Conceptually, this comes very close to the notion of waged labour in disguise as their only asset is their labour power (Breman, 1996).

At the other end, a subgroup of self-employed miners who own some inputs, such as machinery and/or capital, and who are often referred to as pit managers in the literature, exist. This group's main responsibility is to ensure the smooth operation of the pit. Particularly at smaller pits with little to no capital and/or mechanisation, these self-employed workers also engage in digging activities before a pit reaches its production phase. As the lines are blurred and job tasks interwoven, these more affluent self-employed workers, often with many years of ASGM experience, sometimes also (pre-)finance other mining operations, acting as local sponsors. These different roles will become clearer in the course of Section 8.4.

To conclude, the above has shown that waged ASGM activities allowed the majority of respondents to earn daily, and more stable, incomes compared to self-employed activities which were perceived as uncertain. However, this came at the expense of an environment of casual employment where labour conditions and wages are at the discretion of the employer. Another reason for engaging in waged labour was a shortage of capital to finance self-employment. Self-employed miners reported that they worked at neighbouring pits to generate incomes until their own pits reached production stage. Moreover, higher productivity of a neighbouring pit, or ongoing low productivity of their own pit, led respondents to switch from self- to waged employment. Many respondents described self-employment as desirable, as they are not exposed to the discretion of a labour contractor such as the pit manager. Yet, the fact that self-employed diggers had to rely on external capital sources created dependencies on sponsors. Both the high levels of waged employment and the fluidity with which individuals shifted from self- to waged-employment or engaged in mixed-forms, underscore the activeness of ASGM labour markets. Having outlined this, the next section brings together how different employment statuses, jobs, and gender affect income levels in the sector.

8.2 ASGM Incomes: Jobs, Employment Statuses, and Their Gendered Nature

ASM is often characterised as the NFRE with the highest average incomes in the Global South (Jønsson & Fold, 2011). This section begins by examining PSAs at both case study sites and, after offering a brief critique of the way in which Tanzanian ASM incomes were estimated in the past, analyses the incomes of different ASGM jobs and employment statuses. In addition, the section discusses the gendered nature of ASGM labour markets.

8.2.1 Taking Stock of Production Sharing Agreements in ASGM Labour Markets: Locality Matters

As highlighted in Section 2.4, previous research by Merket (2019), Bryceson and Geenen (2016), and Jønsson and Fold (2009) has found that the distribution of minerals across the actors involved in Tanzanian ASM operations is context dependent. Thus, this section examines PSAs in Nyarugusu and Mgusu wards, looking in particular at context-specific aspects. To begin with, PSAs found in Nyarugusu and Mgusu wards mirror PSAs reported by previous research in Tanzania. Based on interviews and survey notes, the most widespread pattern in ASGM operations in both rural wards was: PML holders received around 30%; pit manager roughly 40%; and workers about 30% of the pit's production output of raw ore (interview with Digger 10, 2019). This 30–40–30 PSA had been detected in earlier studies on ASM in central and southern (Jønsson & Fold, 2009) and northwest Tanzania (Merket, 2019). Despite the fact that the 30–40–30 scheme was the most common during fieldwork, a number of variations emerged, two of which are discussed below: the former STAMICO mining site in Busolwa Village, one of the Nyarugusu Ward ASGM hotspots; and the Mgusu Miners Association.

Until 2017, mining land in Busolwa was under the licence of the Tanzanian State Mining Corporation, STAMICO. Thus, no private mining was legally possible. This changed in 2017, when then President Magufuli announced that the area would be given to artisanal and small-scale miners to dig without requiring a PML (interview with Chairmen of Village Development Committee, 2019). Consequently, the STAMICO area experienced an influx of workers; by 2019 the number of miners and processors had grown to around 5,000 of which roughly 2,000 resided on-site (Merket, 2019). We have seen in Section 6.2 that during our visit to Busolwa in March 2019, the

village was characterised by its makeshift dwellings, almost exclusively ASGM activities, and smaller family sizes because many miners had come there without their families. Given the rush-type nature of the settlement, Busolwa was an antipode to other villages in Nyarugusu Ward which were more mature, and economically diversified, mining settlements. The temporary nature of ASGM in Bulsowa and that, as a public mining site, it was not necessary to hold a PML there, affected PSAs as discussed next.

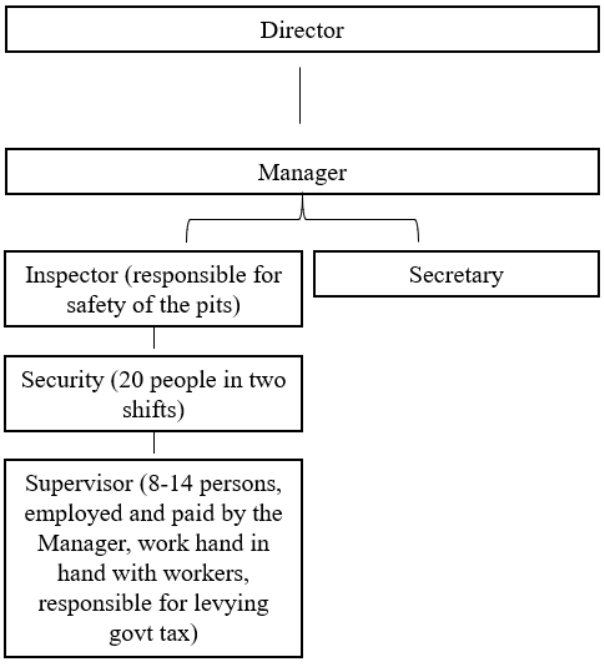
By triangulating information from different informants and field notes, we found the following PSA at Busolwa's public mining site; the pit owner received 45% of the revenue, of which sometimes local sponsors, providing food and/or materials needed to establish the pit, claimed half (field notes, 11 March 2019); of the remaining 55% diggers received 45%, the government 6%–7%, and supervisors 3%–4% (interviews with Supervisor and Digger 4, 2019, as well as field notes, 13 October 2019). The latter group, consisting of 100 supervisors, were charged with collecting the government tax across the licensed area of around 100 acres (interview with Supervisor , 2019). They were not stationed at any one particular pit in order to avoid any 'special' relationships between the supervisor and the pit owner being formed (interview with Supervisor, 2019). This was thought to be beneficial, as changing supervisors were thought to hinder corruption.

Figure 8.1 provides insight into the organisational structure and respective tasks at the public mining site in Busolwa. At the top of the hierarchy stood the director. In descending order the manager, whose main responsibility was to monitor the works of the pit inspectors, security staff, and supervisors follow. At the time of writing, the land continues to be publicly owned. Comparing Busolwa PSA to the most common 30–40–30 PSA, workers received 15 percentage points more, while of the 30% which usually went to the PML holder, around 10% went to the government and supervisors. Likewise, local sponsors local sponsors received a substantial share of around 22.5% for providing informal financial support. Having discussed a first location-specific PSA in Nyarugusu, the analysis now shifts to Mgusu Ward to discuss the role of the local miners association.

The Mgusu Miners Association, established in 2014, holds 20 PMLs which were awarded between 2012 and 2019 and has 787 members (interview with Ex-chairmen of Mgusu Miners Association, 2019). To become a licensed miner in Mgusu, workers have to pay a membership fee to the association. The current fee is TZS25,000 for locals and TZS100,000 for non-locals (interviews with Mgusu Miners Association, Pit Owner, and Sponsor, 2019). This is expensive in relative terms, as many respondents

Figure 8.1

Organisational Structure of ASGM in Busolwa, Nyarugusu Ward



Note. Based on interviews with a Supervisor, 2019, and field notes, 13 October 2019

reported during our household survey that even the old fee of TZS17,000 was challenging to pay (interview with Digger 11, 2019). With respect to the output sharing agreement there, 30% of the sourced ore has to be paid to the Association (interview with Mgusu Miners Association, 2019).

This site-specific PSA leads to different distributional outcomes in Mgusu. Consider the example of a productive mining pit yielding 100 bags of ore. As a first step, operational costs such as food expenses, material, equipment, etc. are deducted by the sponsor. Then, 30% is handed over to the miners' association by the pit owner. The remaining amount is divided among the pit owner and the workers, who receive 35%–42% and 35%–28% of the total of 100 bags, respectively. In Mgusu, pit owners were found to occupy powerful posts such as chairman of the cooperative or local politician (interview with Member of Village Council, 2019). This interlinkage of powerful positions in the local ASGM and in the village society translate into or manifested pre-existing information asymmetries. Consequently, this might skew the playing field concerning acquiring licences and will be discussed in more detail in the Section 8.4.

Comparing the two PSA's, differences surfaced. First, diggers received around 28%–35% and 45% of a pit's production in Mgusu and Busolwa, respectively. The main reason being that in the latter, the association, taking 30% of the sourced ore, had

a strong bargaining position as it has power over who becomes a pit owner. Second, a pit owner received a share of 45% in Busolwa and 35%–42% in Mgusu. Moreover, at Busolwa, the role of sponsors was more obvious, taking around 22.5%, as they (pre)finance operations.

By examining two exceptions to the standard 30–40–30 PSA, this section has shown how contrasting local organisational practices translate into distinct distributional outcomes. Here, the high shares accrued by the Mgusu Miners Association and local sponsors in Busolwa stand out. Yet, to better understand how these PSAs translate into different incomes in both ASGM labour markets, we next look at incomes of different groups of workers.

8.2.2 A Critique of Previous Research Methodologies

As argued in Section 2.4, most publications on ASM incomes in Tanzania focus on diggers (see, e.g, Bryceson et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006) and thus tend to underexplore the heterogeneity of ASGM jobs. This might lead to an upward-biased view of average incomes in the sector. For instance, research on the DRC found a monthly median income between US$84.37 and US$115 for "diggers or washers" but crushers, transport workers, and others were not sampled (de Brier et al., 2020, pp. 9, 15, 16). Yet, a recent study on northwest Tanzania by Merket (2019) found that incomes for crushing (US$54–US$70), and washing and panning (US$20–US$78), were significantly below those of diggers (US$90–US$110).

This illustrates an important point. Excluding certain types of ASM activities – in particular, processing activities at the lower end of the income continuum – might convey an overly optimistic narrative of how ASM incomes can improve rural livelihoods. For this reason, reported average incomes should spell out if, and to what degree, different jobs related to ASGM-activities yield different incomes. Questioning this methodological approach, the thesis argues that mapping and acknowledging *all* types of ASGM is necessary to obtain a more thorough understanding of in which contexts ASGM incomes are poverty-reducing – and in which they are not. Thus, the next paragraphs examine ASGM incomes by disaggregating them by the type of jobs but also by their employment status.

8.2.3 Incomes and Their Link to Employment Statuses

To compare this research's survey data to existing evidence, the analysis shifts from the household to the individual level. In the surveyed population, a total of 196 individuals across 160 households were engaged in ASGM activities. Of these 196, 66 had not accrued any income from ASGM activities during the 30 days prior to the survey. This begs the question of how to proceed with analysing average incomes when some respondents reported zero incomes.[142] To begin with, the survey's reference period of 12 months for occupational activities differs from the income reference period which was 30 days prior to the date of the survey. For the former, as discussed in Section 3.3.1, this research defined a reference period of 12 months prior to the survey to include all livelihood activities. However, an equally long reference period for gathering data on incomes would have biased the data as recalled earnings over 12 months cannot be precise. Furthermore, respondents who were active in ASGM in the 12 months prior to the survey might not have engaged in ASGM-related tasks in the 30 days prior to the survey, therefore not earning ASGM-related incomes during this period.

Consulting the data again, of the 66 miners who did not report any income in the 30 days prior to the survey, 36 had not engaged in ASGM in this time period and were thus excluded when calculating average incomes. Thus, 30 miners (15% of all sampled ASGM workers), who, despite having engaged in ASGM work in the month prior to the survey, did not report any ASGM income for that time period, remained. As self-employed ASM activities are characterised by a long period of digging without income before a pit becomes productive, individuals who were not engaged in waged labour might be over-represented in the 'zero-incomes' cohort. Revisiting the data, it was found that of the remaining 30 individuals, 13.3% were waged, 30% self-employed and 56.7% waged and self-employed. Research on mining incomes in the DRC found that 17% of respondents had not accrued any income during the last month (de Brier et al., 2020). Consistent with de Brier et al. (2020), who decided not to consider miners that did not accrue any ASM-related incomes during the reference period, this research abstained from considering the group of zero-income respondents, contending that

[142] Including miners that reported zero income in the last 30 days leads to a 35% lower average income: 71 out of 74 miners reporting zero mining incomes were benefitting from incomes of other household members.

these 15% mirror similar sectoral dynamics to those studied by de Brier et al. (2020). Having outlined these methodological choices, I next present evidence on income averages.

Table 8.6 shows an average monthly income for all reported ASGM activities of US$69.[143] This is significantly lower than the estimations of ASM monthly incomes of US$99 and US$90–US$110 reported by Bryceson et al. (2014) and Merket (2019), respectively. Comparing different types of ASGM employment statuses, self-employed and waged miners reported similar average incomes of US$45 and US$47, respectively. These averages are slightly higher than incomes of Tanzanian farmers. Rapsomanikis (2015), analysing the 2009 Health and Development Survey, reported a monthly incomes of around US$38 from farming, while a small-scale survey by Mueller (2012, 2015) from 2008 found that casual employment in farming earned around US$17–US$34 per month. Given that both data are more than 10 years old, one ought to be cautious comparing these numbers to incomes today. For example, the average annual inflation rate from 2008, the year of Mueller's survey, until 2019, the year of my survey, has been 7.9% (World Bank, 2021b). Lastly, my data show that a third group, miners working for both a wage and as self-employed, earned the highest amount, US$93.5 per month. This indicates that a dual employment strategy might help to tackle problems of income volatility.

Note that locality in combination with access to different types of employment status affected incomes. As Table 8.6 shows, ASGM incomes in Nyarugusu Ward were, on average, slightly lower than in Mgusu Ward. Two strategies were particularly rewarding: adopting a hybrid strategy in Nyarugusu (US$99.40); and pursing self-employment in Mgusu (US$170).[144] Waged activities, earning US$44.8 and US$50 in Nyarugusu and Mgusu, respectively, yielded lower earnings than ASGM incomes from self-employment. It should be noted that Table 8.6 does not differentiate by the type of job linked to a specific status of employment. For this reason, the analysis proceeds by by analysing if and how distinct jobs affected income levels.

[143] The average income was calculated across all individuals pursuing ASGM activities and reporting ASGM incomes larger than zero (n=130) including all types of waged and self-employed employment statuses. The reported average incomes are not denominated in real terms as the changes in price levels for rural areas might be different to the national average.
[144] However, given that only three individuals fall into this category, explanatory power is limited.

Table 8.6

ASGM Incomes Across Employment Statuses by Location

		Type of employment status		
	Average	Wage and self-employed	Waged only	Self-employed only
Entire sample	US$69.0 (n=130)	US$93.5 (n=63)	US$47.3 (n=29)	US$45.0 (n=38)
Nyarugusu	US$68.5 (n=98)	US$99.4 (n=49)	US$44.8 (n=14)	US$34.2 (n=35)
Mgusu	US$70.9 (n=32)	US$72.0 (n=14)	US$50.0 (n=15)	US$170.4 (n=3)

Note. Source: Own data. Includes all individuals reporting ASGM-related incomes; conversion rate: TZS2,288.21 per US$1.

Table 8.7 presents disaggregated information on average incomes across distinct types of ASGM jobs. A first finding is that ASGM tasks are characterised by different income magnitudes. Processing tasks yield an average of US$35.5 while diggers earn US$62 per month – roughly twice as much. Disaggregating incomes within both groups, further differences surface. For instance, stone collectors fared better (US$41) than other processing workers such as crushers (US$30). At the upper end, service-related ASGM jobs such as being a sponsor, a trader, or even the owner of a small processing plant yielded US$131, US$284, and US$841, respectively. The lower incomes of ASGM processing tasks such as crushing and washing, but also of digging, compared to trading and sponsoring echo findings from previous research (e.g. Bryceson et al., 2014). In line with this, high incomes accrued by the owners of processing plants confirm previous findings by Merket (2019) of ball mill and leaching plant operators' average monthly incomes of around US$132 and US$67–US$217, depending on their production, respectively.

Employment status also affected incomes within a job category. Taking the example of diggers, self-employment yielded higher average incomes, at around US$68, than waged employment, which generated an average income of US$53 (see Table 8.7). Diggers deploying a dual strategy, earning US$56 on average, fared slightly better than waged workers but worse than self-employed diggers Moreover, a digger's income depended on the risk involved. A male digger in Nyarugusu said that "some miners

Table 8.7

ASGM Incomes for Distinct Jobs

Type of ASGM activity	n	%	Cum.	Mean income in TZS	Mean income in US$
Processing	35	-	26.92	81,142.86	35.5
Collector	14	10.77	10.77	94,285.71	41.2
Crusher	15	11.54	22.31	69,333.33	30.3
Crusher and collector	2	1.54	23.85	55,000	24.0
Transport	1	0.77	24.62	150,000	65.6
Washer	3	2.31	26.92	73,333.33	32.1
Digging	86	66.15	93.07	141,564.1	61.9
Waged	25	19.23		122,120	53.4
Wage and self-employed	22	25.58		129,204.5	56.5
Self-employed	39	45.35		156,576.9	68.4
Owns processing plant	2	1.54		1,925,000	841.1
Gold trader	1	0.77		650,000	284.1
Sponsor	2	1.54		300,000	131.1
Rents out equipment	2	1.53		25,000	11.0
Supervisor	2	1.54		85,000	37.2
Total	130	100.00	-	157,784.6	69.0

Note. Source: Own data. Includes individuals reporting an income from ASGM in the last 30 days only. Conversion rate: TZS2,288.21:US$1.

prefer to get work at *malongo* [deep pits] … because deep pits contain more minerals compared to shallow ones and most of the successful people … in the village are those who work at malongo" (interview with Digger 5, 2019).[145] Another respondent explained that "after a week or two I will be back with three million or more after being employed by others working underground" (interview with Supervisor , 2019). However, some respondents stated that they avoid deep pits: "I have never worked in these big and deep pits … I fear entering these deep pits because of the safety. I always go on people's fields to dig in these shallow pits" (interview with Digger 3, 2019).

Refining the point made in Table 8.6, it is not the type of employment status per se, but the type of ASGM job linked to a specific employment status, which shaped the income level. Having analysed income levels linked to distinct jobs and employment statuses, the next section analyses female workers, who predominantly engage in

[145] Unfortunately, the empirical framework of this research was not suited to enquire how high-risk employment, such as working in a deep shaft, is rewarded differently to working above ground. Nevertheless, the role of risk surfaced during qualitative interviewing, and some respondents were afraid of working at malongo.

processing tasks. Hence, it picks up the earlier discussion on restricted access to the position of the pit manager in Mgusu and discusses how gender affects ASGM income levels.

8.2.4 The Gendered Nature of ASGM Incomes

Despite around 20%–30% of Tanzania's ASM workforce being female (UN Women, 2016), evidence on the role of female miners is scant and little is known about their lived experiences (Mutagwaba et al., 2018).[146] We have seen in Section 8.2.3 that digging activities yield higher incomes than processing tasks and know from previous research that female miners are particularly disadvantaged and located in the lowest-paid sections of ASM activities (Fisher, 2007; Merket, 2019). Given this imbalance, this section examines income differences along distinct jobs and employment statuses through the lens of gender to understand how the latter might restrict and facilitate access to distinct occupations and income levels.

The 2019 survey reported similar levels of females involved in ASM compared to previous research. In Mgusu and Nyarugsu wards, 22.7% and 26.6%, respectively, of the labour force was female, for an overall total of 25.4%. This is higher than the 20% reported by Merket (2019) and lower than the 27.6% found by Tanzania's 2012 ASM baseline survey (Ministry of Minerals and Energy, 2012).

Women earned significantly less than their male counterparts from ASGM work. As Table 8.8 indicates, across the full sample, men and women engaging in ASGM earned US$79 and US$32, respectively. In Nyarugusu, the gap was equally pronounced, with male workers earning US$80 and female workers US$29 on average. In Mgusu, however, this gender income gap was somewhat smaller, males and females earned US$75 and US$45, respectively. Having made this broader point, the analysis next examines the role of employment statuses and type of job on gendered income effects.

As shown in Table 8.8, across the full sample, the gender income gap was the strongest for the group adopting a mixed strategy of waged and self-employment. In this group, males and females earned an average of US$110 and US$31, respectively. In the waged ASGM worker group, male and female workers earned US$51.50 and US$37.90, respectively. Lastly, self-employed males earned on average US$48.70

[146] Likewise, marked regional differences exist; in the Lake Zone 28% of the ASM workforce are women whereas in central Tanzania only 15% are female (UN Women, 2016).

while their female counterparts made US$25. One reason for these differences might also be location; in Nyarugusu, female ASGM workers on average earned 63.8% less than their male peers, while in Mgusu this gender income gap was 40.6%. The gender income gap across the full sample was 59.5%. Lastly, female miners were more likely not to have earned anything in the 30 days prior to the survey, as they constituted only 21.4% of the initial 25% of our sample after adjusting for 'zero-incomes'. Thus, to conclude, females' access to specific types of employment types differed across the two study sites.

Taking the analysis of the gender income gap a step further, Table 8.9 links the types of ASGM activities and their respective average incomes to gender. Females are almost exclusively engaged in processing activities such as crushing and collecting stones. Overall, 77% of surveyed processing workers were female. At the same time, of 86 surveyed diggers, only one was female. Importantly, these typical jobs pursued by females and males translated into very different income levels. As shown in Table 8.9, female processing workers earned US$32 on average, whereas their male peers earned around US$45.[147] This indicates that even for the same work task, incomes were gendered. Moreover, the highest incomes, which are, as outlined earlier, found in sponsoring and trading but also to a lesser degree in self-employed digging, were restricted to males only. Thus, female workers were confined to work tasks accruing the lowest incomes. What are the possible explanations for this gender gap in ASGM incomes? Evidence emerging during the interviews with ASGM workers might help to answer this question.

[147] This statement requires a word of caution, as the number of male processing workers (n=8) is rather small to derive a meaningful average. Nevertheless, an indicative trend is visible.

Table 8.8

ASGM Incomes by Gender and Employment Status by Location

Monthly mean income	Average		Wage and self-employed		Waged only		Self-employed only	
	Male	Female	Male	Female	Male	Female	Male	Female
Full sample	US$79.1 (n=102)	US$32 (n=28)	US$110 (n=50)	US$31 (n=13)	US$51.5 (n=20)	US$37.9 (n=9)	US$48.7 (n=32)	US$25.2 (n=6)
Nyarugusu	US$80.3 (n=75)	US$29.1 (n=23)	US$99.3 (n=37)	US$32.5 (n=12)	US$55.4 (n=9)	US$25.8 (n=5)	US$36.1 (n=29)	US$25.2 (n=6)
Mgusu	US$75.7 (n=27)	US$45 (n=5)	US$77 (n=13)	US$13.1 (n=1)	US$48.4 (n=11)	US$53 (n=4)	US$170 (n=3)	-

Note. Source: Own data.

Table 8.9

ASGM Incomes by Gender, Job, and Employment Status

Type of ASGM activity	n	%	Cum.	Mean income in TZS	Mean income in US$
Processing	35		26.92	81,142.86	35.5
Female	27			73,962.96	32.3
Male	8			105,375	45.1
Collector	14	10.77	10.77	94,285.71	41.2
Female	11			90,636.4	39.7
Male	3			107,666.7	47.1
Crusher	15	11.54	22.31	69,333.33	30.3
Female	14			63.571.4	27.8
Male	1			150,000	65.6
Crusher and collector (females only)	2	1.54	23.85	55,000	24.0
Transport (male only)	1	0.77	24.62	150,000	65.6
Washer (male only)	3	2.31	26.92	73,333.33	32.1
Digging	86	66.15	93.07	141,564.1	61.9
Waged (males only)	25	19.23		122,120	53.4
Wage and self-employed (males only)	22	25.58		129,204.5	56.5
Self-employed	39	45.35		156,576.9	68.4
Female	1			50,500	22.1
Male	38			159,368.4	69.6
Service-related tasks (males only)					
Owns processing plant	2	1.54		1,925,000	841.2
Gold trader	1	0.77		650,000	284.1
Sponsor	2	1.54		300,000	131.1
Rents out equipment	2	1.53		25,000	11.0
Supervisor	2	1.54		85,000	37.2
Total	130	100.00		157,784.6	69.0

Note. Source: Own data. Includes individuals reporting an income from ASGM in the 30 days prior to the survey only. Conversion rate of TZS2,288.21:US$1.

First, socio-cultural norms were harnessed by powerful males to restrict female ASGM workers' access to higher income strata. In our survey, none of the female ASGM workers worked underground. Moreover, a respondent in Mgusu claimed that traditional belief systems banned females from entering mining sites:

> Women in Mgusu are not allowed to go and to collect stones on top of the Mlimani Mining Site [the only place where mining occurred in the village] because of traditional beliefs. People believe that if a woman goes there, she

> causes gold not to be found. Generally, it is a 'bad omen' for a woman to go to a mining site! (Interview with Ex-chairmen of Mgusu Miners Association, 2019)

Another example about female miners looking to obtain a mining permit, reinforces this point:

> In our village there is no other group with a mining licence apart from the association itself. But there is a group of women and I was trying to influence the association to give them a permit within the association licence so that they can have their own pits, but people disagreed with my suggestion. For example, the association has a licence to extract minerals at 20 different plots but until today they have extracted only four out of 20 plots. Therefore, it would have been possible to give women one or two plots to have their own pits and let them give a certain percentage to the association as others do. (Interview with Pit Owner, 2019)

On the one hand, the statement underlines that gender matters, as power, in the form of access to higher income levels as a self-employed digger, is in the hands of the male-dominated Mgusu Miners Association, which has no incentive to allow females to enter this power stratum and vested interests in maintaining the status quo.[148] This is consistent with Gerig et al. (2020), who contend that there is a "glass ceiling" in ASM as it is traditionally a sector "where women are discriminated against with respect to land and allocation of mineral rights" (p.11). On the other hand, the exploration of only 20% of the available mining land (four out of 20) indicates that there is either a capacity or a profitability problem.

These norms can be linked to the interests of male ASGM workers to protect higher-income positions and adds to Sender & Smith's (1990) findings that among farming households, males restricted females' access to waged farming labour and accrued all incomes to themselves. This highlights that intra-household dynamics affect who is entering the labour market and which part of it. With respect to ASM, previous publications indicate that female miners often shoulder the burden of domestic work such as cooking and childcare and are thus unable to work the same hours as their male counterparts (World Bank, 2015a). To cope with this disadvantage, in both Nyarugusu

[148] Note that this restrictive access to self-employment in Mgusu also surfaced when interviewing waged male miners in the rural ward.

and Mgusu, females brought their children to the crushing or processing sites, combining childcare duties with the need to contribute to the family income.

Second, the related health risks as well as the uncertainty involved in the process were high. The latter is summarised by a female crusher reporting "at the end of all the processes you can end up with a loss because we just gamble. We do this business by betting, not sure if we will get gold" (interview with Crusher 1, 2019). Health risks include not only the application of mercury but also inhaling dust: "some women are crushing stones at mining centres and bring their young children, exposing the health of the children to different diseases because of dust" (interview with Member of the Local Government Council, 2019). Moreover, processing pre-crushed raw ore at ball mills was expensive for female workers. As described by the owner of a crushing machine, after manually crushing the ore, many female workers could only afford four or five rounds of crushing per month, as one round costs around TZS3,000 to TZS5,000 (interview with Crushing Machine Owner, 2019). Subsequently, processing workers washed the remaining small stones, applied mercury, and panned them in the hope of striking gold.

The finding that over 95% of surveyed female ASGM workers pursued processing tasks and thus earned the lowest sectoral incomes questions the argument that ASM allows females to climb the occupational ladder and/or to escape poverty. H. Verbrugge & Van Wolputte (2015) described female miners as a heterogeneous group consisting of crushers and service jobs related to ASM such as working as cooks or barmaids, whilst earlier, Fisher (2007) had concluded that "Some have found a successful niche which they exploit (for instance in service activities) or are breaking traditional boundaries (to become owners of mineral titles, for example)" (p. 741). My data do not support these claims. They rather speak to Merket's (2019) argument that women rarely managed to become a licence holder or pit manager, whereas males in positions of power, such as being a trader, use this power, for instance, to demand higher prices from female workers buying ore for processing activities.[149] Moreover, Merket (2019) reported that customary marriage law and inheritance systems impede access to finance for female miners.

[149] This research was unable to test this claim as the survey did not enquire systematically about the gold prices faced by ASGM workers.

Lastly, ongoing mechanisation of crushing particularly affects female miners as exemplified by the introduction of ball mills from the early 2000s onwards (Mwaipopo et al., 2004). As female miners are mainly employed to crush ore, the increased use of ball mills to grind stones, instead of manual labour, has affected them particularly negatively (H. Verbrugge & Van Wolputte, 2015). Despite, the fact that today the ore is still pre-crushed by females, ball mill operators, mainly men, now accrue revenues which originally could be claimed by female workers.

To conclude, female workers earned significantly, roughly 60%, less than their male peers. The main reason for this gender income gap is that female ASGM workers were confined to processing tasks which yield the lowest sectoral incomes. At the same time, access to high income tasks, such as sponsoring, is dominated by men. The example above of the unsuccessful application for a mining licence by a group of female miners in Mgusu and its rejection by the male-dominated Miners Association indicates that power over resources, and access to different jobs and thus income level, was strongly skewed towards males. Having outlined how power dynamics affect these labour market outcomes with respect to gender, the analysis now shifts translating the previous findings into a framework of different classes of ASGM labour.

8.3 Classes of ASGM Labour

The chapter has highlighted a marked degree of heterogeneity in ASGM incomes across different ASGM jobs and employment statuses. Moreover, Chapter 7 by analysing qualitative findings on poverty, and survey data concerning quantitative poverty indicators and assets disaggregated by incomes (see Table 7.11), has shown that living standards were heterogeneous and that few respondents found ASGM activities to be poverty-reducing. This section draws on Bernstein's (2007, 2010) framework of classes of labour to conceptually link both findings. Following Mezzadri and Fan's (2018) empirical application of the concept, these classes were based on workers' incomes and working conditions as well as according to their relations to the means of production.

A first 'class of labour' can be defined as consisting of waged ASGM processing workers – the majority of them female – with below-average incomes of around US$35. However, as highlighted previously in Table 8.10, incomes within the group of processing workers were heterogenous and depended not only on the type of processing

task pursued but also on gender. On average, collectors of raw ore earned US$41.20 while stone crushers accrued only US$30.30. Female miners were paid on average US$32 monthly, 60% less than their male counterparts. As outlined during the discussion on the Mgusu Miners Association, males in labour market positions linked to higher incomes exerted their power to block female access to higher income levels such as being a trader or the owner of a PML. Moreover, processing workers were particularly likely to be exposed to health-related dangers.

A second 'class of labour' consists of casual waged diggers who earned more (US$53.40) than processing workers. During the non-productive phase of a pit these workers earn wages of around TZS2,000/day and subsequently received around 30% of the raw ore produced. As discussed in Section 8.1.2, given the oversupply of workers, they are subject to weak bargaining power and often find themselves in situations in which the pit manager has the stronger leverage, sometimes resulting in them taking a larger production share than agreed. Despite their low incomes, many stated that they need these regular incomes to take care of their families.

This is closely linked to a third 'class of labour', diggers who combine waged and self-employed activities, earning a monthly average of US$56.50. As highlighted in Section 8.1.2, this group moves between waged and self-employed activities for two reasons: to obtain income whilst they are developing their own pit or if, once developed, it is not yielding ore. This underlines that a binary understanding of self-and waged employment does not capture the complex employment realities of miners.

Last, a fourth 'class of labour' of 'self-employed' diggers exist. Despite the self-employment label, they should be considered labourers in disguise, as they do not own substantial production inputs apart from their labour power. These self-employed workers earned higher incomes, US$68.40 on average, but were also exposed to long periods of no income given that developing a pit takes a long time and pits do not produce continuously. Despite the fact that they are not at the discretion of a pit manager, many depended on local middlemen to sponsor periods of self-employed development of a pit.

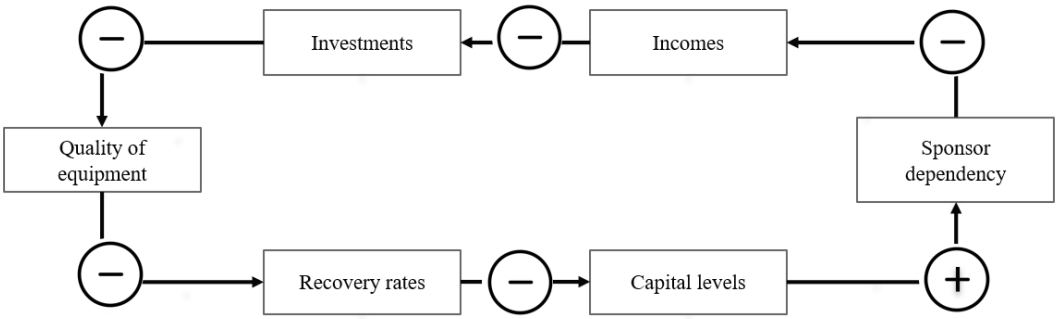
To conclude, a word of caution is needed. The lines between classes two to four are fluid given that diggers might once in a while shift from being waged employed only to becoming a self-employed worker. Nevertheless, applying these concepts is helpful to highlight that marked differences with respect to agency and structural position exist not only across the surveyed and interviewed ASGM labour force, but

also within the category of diggers and processing workers. The structural positions of these workers limit a household's agency and influence access to specific ASGM jobs. Thus, households engaging in ASM activities do not experience change homogeneously as a single class, which highlights rural differentiation through ASM labour.

With respect to this, it can be argued that parts of the ASGM labour force are caught in an ASGM micro-level poverty trap which reinforces structural poverty. As visualised below in Figure 8.2, the mechanisms creating the trap can be summarised as follows. Starting on the left hand side, first, for ASGM workers low-quality equipment translates into low recovery rates which in turn result in low to non-existent levels of capital. Consequently, this leads to a high degree of dependency on sponsors' informal loans. Such dependency on sponsors negatively affects already relatively low earnings. All combined, low capital levels, poor equipment, and sponsor dependency, allow a basic living for many ASGM workers but not to develop and to overcome poverty structurally. To deepen the analysis of sponsor dependency, the next section scrutinises the role of informal finance.

Figure 8.2

Stylised Poverty Trap



Note. Sources: Own data; Barry (1996, p. 4, Figure 1); Hilson (2012, p. 196, Figure 2).

8.4 The Role of Informal Finance

Previous research on ASM in SSA contends that middlemen exacerbate the exploitation of local labour through informal business agreements (Spiegel, 2012), as disenfranchised workers have no choice but to rely on them for food, equipment and cash loans (Banchirigah, 2008; Hilson & Pardie, 2006). This comes as no surprise, given that informal workers, as examined in this thesis but also by previous publications (Roever & Rogan, 2016), are subject to insecure and unsteady income streams and, as

such, are rarely able to obtain formal credit. Contrary to popular beliefs and strategies by international institutions, 'the unbanked' might have good reasons for not accessing formal finance. A 2017 study by the Philippine Central Bank showed, that out of 73% of its population, 60% reported lack of money as the key reason they did not have a bank account, echoing a 2015 World Bank report which found that globally, 59% of the 'unbanked' gave the same reason (Demirguc-Kunt et al., 2015). Moreover, people living in poverty restrict their credit borrowings to basic needs only, as formal credit in the Global South is often characterised by high interest rates and can lead to over-indebtedness (Schicks, 2013).[150]

Section 7.2 noted that capital is scant and so there is a strong dependency on conditional informal credit, linked to advance sales. This section takes this analysis a step further by examining the role of informal finance in the context of ASGM's political economy. It begins by discussing the role of sponsors and traders, and then scrutinizes the complex interdependencies of miners and local middlemen. Sponsors equip workers with additional loans for basic needs as highlighted by the following quote:

> Sponsors are always there at the pits to support people. By working in someone's pits it is easy to access a loan from a sponsor as he knows that he will have his money back from your pay, even if it will take a week. We sometimes go to them and ask for a loan and they trust us because we are working there, so they easily provide a loan to us and through it we can support our family. It is hard for them to trust us outside the working environment, thinking that we may run away with their money, so they always ask 'where do you work?' (Interview with Digger 9, 2019)

This is because capital is scant and formal loans practically inaccessible for many individuals engaged in ASGM. As outlined previously, a second common practice of local sponsors is to financially support mining pits that have yet to produce ore:

> In Mgusu, many pits are sponsored. The sponsor always gives money to the diggers every day. This money could be for food or other small expenses in or outside the pits. Because someone wants quick money for his family, they decide to be employed in a productive or sponsored pit; even if they do not get

[150] Jønsson and Fold (2009) reported an interest rate of 20% by formal credit institutions.

> gold, they will get TZS2,000 for food which is provided by the sponsor. …Miners need quick money to support their families and while working in sponsored pits you are given money by the sponsor for daily food expenses. (Interview with Pit Owner, 2019)

Not only do sponsors pay a daily allowance of between TZS2,000 to TZS5,000 to workers before a pit enters production, they also prefinance inputs such as timber supports and other equipment.

Once the sponsor has received his, and the miners, their respective shares of raw ore, traders enter the scene. A trader is either a broker or a dealer; the former are only authorized to trade domestically, while the latter have the right to sell minerals outside the country (Merket, 2019). In 2012, 128 mineral dealers were registered in the country; most of them of Indian- or Pakistani-Tanzanian background and based in Dar es Salaam, Arusha and Mwanza (HRW, 2013; Merket, 2019). Access to trading is costly, a broker licence currently costing around US$109.25 (Malanga, 2021).

It is worth noting that during our research, we found that these positions are often intertwined. For example, sponsors also acted as mineral traders (interview with Sponsor, 2019) and often secured the right to advance purchases below the market price from the pits they supported. In the words of a sponsor in Mgusu, "When they [diggers] get gold, the agreement is that they have to sell it to me and when I buy their gold, I also sell it to the Geita gold market" (interview with Sponsor, 2019). In some cases, miners reported that sponsors demanded interest on loans on top of demanding an advance sale (interview with Digger 10, 2019), while others told us of doctored scales and that sponsors offered non-uniform prices to different people (interview with Crusher 2, 2019).

The role of local sponsors and traders outlined above is somewhat comparable to Vogel's (2021) findings on local mineral powerbrokers in the DRC, the *incontournables*. A group which is "impossible to sideline, unavoidable … and instrumental in shaping their surroundings and operating through them" (Vogel, 2021, p. 179). Vogel argues that the *incontournables* exert local patronage, depending on their assets such as "means, connections" and "reputation" (p. 182), by "connecting different networks" (p. 186). However, the *incontournables* in the DRC were not only local traders but also "chiefs, rebels-turned politicians, [and] military commanders" (p. 189). My data confirm such structural power positions in case of (former) chairmen of the miners association in Mgusu, who had strong leverage over who becomes a pit owner.

Figure 8.3 helps to visualise the role of finance, linking together PML holders, pit managers and workers, and also brokers and dealers. The grey dashed line demarcates the PSA and highlights which actors receive what share of a pits production output. Moreover, processing workers are paid in cash, while urban brokers play a minor role. The figure emphasises the dynamics between sponsors and diggers, which the next paragraphs will scrutinise.

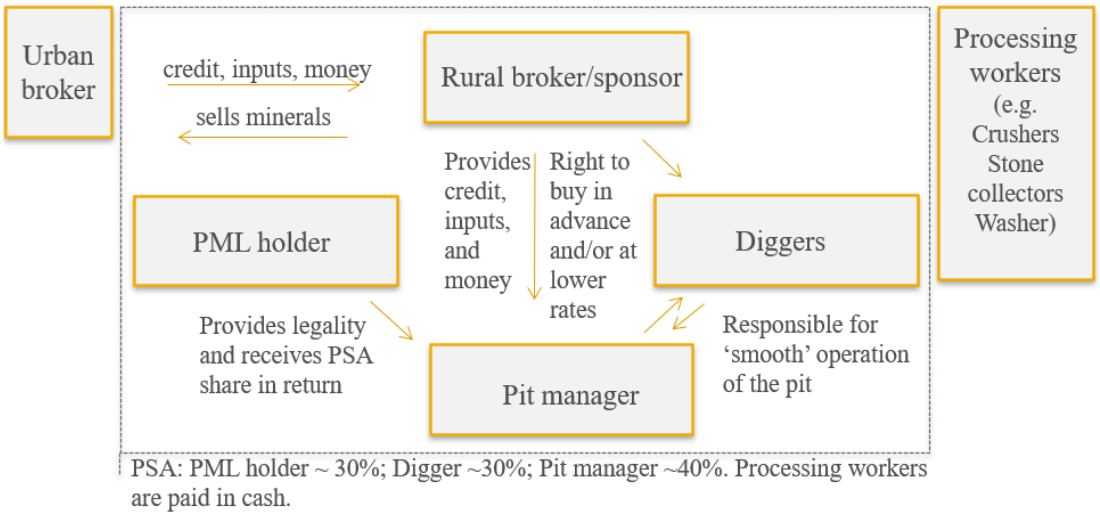
Diggers' dependency on sponsors translates into unequal terms of trade. The experiences of one respondent highlight how sponsor dependency is linked to the sale of gold at below market prices and thus illustrates how informal finance might be one of the drivers of existing rural inequality:

> I will never forget when in 2013 we managed to get 300 grams … and gave it to Martin [a local broker] to sell it at Geita market. Back then, the price was TZS70,000 per gram, but when he was there … he called us, arguing that people are ready to take it only for TZS50,000 per gram. We had no choice, so we agreed to sell for that price because he had sponsored us from the beginning, and we had borrowed from him for a long time. (Interview with Digger 1, 2019).

The quote above further underscores how miners face a strong degree of discretion by their sponsor(s). Speaking to this narrative, a local village committee member stated that "they [sponsors] only generate their own income by providing financial support to miners because they always buy people's gold at very low prices and sell it for a higher

Figure 8.3

Stylised Structure of ASM Labour Markets



Note. Sources: Own data; Weng et al. (2018)

price, even higher than the announced price in the market" (interview with Chairmen of Village Development Committee, 2019). This strong bargaining power reflects, in a nutshell, the control that the holders of capital have over ASGM self-employed workers.

Another aspect is that the sale of gold at below market prices is not only subject to the conditions imposed by sponsors but also driven by the need to quickly convert gold into cash to make ends meet. This is particularly true for vulnerable households in need of money. Moreover, many sell quickly, as they do not have a safe place to hide the gold and travelling to the next bigger market, Geita Town, is expensive. Given this dynamic, ASGM workers in dire material need face a double disadvantage (interview with ASM researcher, 2019). As they need cash, they aim to sell their minerals quickly and often to the first buyer who comes to the mining site who, however, offers lower prices than buyers in larger cities. The following quote, from an interview with a miner, neatly describes this dynamic:

> If they managed to save an amount of gold that makes it worthwhile for them to travel to a trading hub, they could get a much better price and they would substantially gain, but only those who maybe have a nicer house or that have somebody to take care of their gold for them can actually do that. So, that is where they lose out twice. (Interview with ASM researcher, 2019)

The asymmetry in the bargaining power between the two groups has its roots in the fact that capital is scarce and traders are more mobile than most ASGM workers who need cash.

Likewise, sponsors are needed, as driving sponsors out of the market intensifies the sector's undercapitalisation, as highlighted by the 2019 attempt by the Tanzanian government to formalise the country's ASM sector (see Section 5.5). Part of this effort was the establishment of regional mineral trading centres (*The Citizen*, 2019a), in an attempt to regulate the buying and selling of minerals and to increase government revenues, thus fighting smuggling and tax evasion (*The Citizen*, 2019c). By setting a daily minimum buying and selling price at these centres, the government argued that a more level playing field between miners, traders, and sponsors would emerge (Gilliard Lukoya, as cited in *The Citizen*, 2019c). Nevertheless, such regulation was hard to enforce. As the executive secretary of the Federation of Miners Association of Tanzania (FEMATA) pointed out, there was an urgent need for "the government to step in by punishing buyers who were taking advantage of the weak bargaining power of small-

scale miners, to buy minerals at a price below the one directed by the authorities" (Malanga, 2021). Equally, traders might argue that the government set prices too low.

During the first fieldwork period in spring 2019, a trading centre in Geita Town and a smaller mineral buying station in Nyarugusu village opened (*The Citizen*, 2019c). The quantity of gold sold at Geita's trading centre doubled within a month (*The Citizen*, 2019b). At the same time, the government cracked down on informal ASM financing. One miner argued that this might translate into a situation of a credit crunch:

> In previous times, we used to have sponsors in the community who used to finance us when we needed cash and we agreed to sell our minerals to them. But the establishment of the market has changed everything as they no longer finance us and some of them have been arrested by the government. (Interview with Digger 1, 2019)

The above quote suggests that the well-intentioned government measure to empower miners by reducing the number of local middlemen might lead to an unexpected negative outcome. To improve access to capital, FEMATA argues that mining licences should be accepted as collateral to access loans – and for the issuing of "loans to small-scale miners at affordable interest rates and terms" (Malanga, 2021). Yet, the vast majority of the surveyed miners in our sample did not hold a mining licence, which indicates that even if FEMATA's call were to be answered, the situation of self-employed diggers would remain unchanged. These dynamics underline the complex underlying power relations in the sector. At the time of writing, it is difficult to assess what effect the reduction in informal financiers will have on the power relations and, as a consequence, on the material realities of self-employed diggers in need of borrowed capital for their operations.

Having discussed the prevalence of different ASGM employment statuses and jobs as well as respective incomes linked to them, the role of gender, and of finance, the concluding section juxtaposes these findings with existing literature. Moreover, it links the analysis of ASGM labour to the one on poverty in Chapter 7.

8.5 Conclusion

A number of considerations arise. First, waged ASGM employment was common in both Nyarugusu and Mgusu wards, and respondents, constrained by their labour market position, alternated between self- and waged employment. Even though

it has been argued that miners change their occupation over space and time (Jønsson & Fold, 2009) and that individuals at the top of the sector's occupational ladder are more mobile than workers at lower levels (Jønsson & Bryceson, 2009), my research suggests that employment statuses are underexplored in the ASM literature to date. Moreover, my findings highlight that conventional labour survey data such as in the 2006 and 2014 ILFS, which are not adjusted to regional context and sector specifics, insufficiently reflect the heterogeneity of employment statuses and the 'actual' levels of waged labour in rural labour markets. They are also silent on hybrid employment strategies.

Informal ASM activities, to date, have been predominantly characterised as self-employed, whereas this research found that this is not necessarily the case. More specifically, the thesis speaks to Breman's (1996) seminal work on Indian informal workers, arguing that self-employed activities are often effectively waged labour. There, landless rural poor constitute a group of 'footloose' labourers who are dependent on casual, piece-rate, labour incomes and frequent migration, as they do not own any land to farm and instead rely on selling their labour force. Note the strong similarity to my findings of waged ASGM labourers and their daily search for casual employment at a mining pit in an environment of labour oversupply, selling their labour power "under precarious and vulnerable conditions to asset owners" (Rizzo, 2017, p. 11) such as the owners of processing plants or to pit managers. My findings question the narrative in the ASM literature that the sector consists of self-employed individuals and instead highlights the significance of ASM labour markets and how they contribute to large variations in incomes. Such questions concerning internal differences in ASM labour markets and their implications have received little attention in the ASM literature to date.

Second, the type of ASGM job strongly affects the income earned. Processing tasks yield an average monthly income of US$35 whereas digging pays, on average, around US$62. Female ASGM workers were engaged exclusively in the former and thus were faring much worse than their male peers. Acknowledging these marked income differences, this thesis contributes a more disaggregated view than previous estimations of ASM incomes in Tanzania (Bryceson et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006; Merket, 2019). The fact that there is a marked degree of internal differentiation shows that individuals engaged in processing activities at both case study sites do not fare much better than farmers who are argued to earn between US$17

and US$38 (Mueller, 2011; Rapsomanikis, 2015).[151] For this reason, particularly for crushers, washers, and collectors, ASGM incomes do not necessarily improve their wellbeing compared to waged farming.

Third, not only the type of ASGM job but also employment status affects ASGM incomes; this is particularly significant in the case of digging-related activities. As outlined in Table 8.7, waged diggers earned lower incomes than their self-employed peers. At the same time, a strategy of combining waged and self-employed digging accrued significantly higher incomes than those earned through farming. Further, this research reports a third group of workers that engages in both waged and self-employment. Cramer et al. (2008) argue that in rural Mozambique, waged work is central to the livelihoods of the poorest. Similarly, findings by Erlebach (2006) on Rwanda suggest that households living in poverty and engaged in non-farming activities tend to be confined to poorly remunerated activities. This is confirmed by my data. Both ASGM labour markets are segmented, and the poorest are restricted to certain types of ASGM tasks, such as processing tasks. Women are also over-represented at the lower end of the labour market. In light of this, the thesis promotes a holistic approach to the sector which analyses not only the reality of diggers but also of other types of work in ASGM, such as processing and trading. This matters because previous research (Bryceson, Fisher, et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006) has overlooked tasks other than digging, and how this heterogeneity translates into heterogeneous incomes.[152]

Table 8.10 summarises the qualitative and quantitative evidence discussed in this chapter. The first row outlines that waged labour is prevalent and that labour choices are shaped by household necessities, the paucity of finance, and cultural norms. The second row underlines that ASGM incomes are heterogeneous and that not only ASGM tasks but also employment statuses affect incomes. The remainder of this section links these findings to those presented in the earlier empirical chapters, to derive a set of larger conclusions from this research.

[151] Again, note that these reported incomes are based on data from 2008 and 2009. Nevertheless, they help to situate the different ASM incomes in the wider context of rural incomes in Tanzania.
[152] One exception is Merket (2019) who reports monthly incomes of US$54 to US$70 for crushers.

Table 8.10

Joint Display of Quantitative and Qualitative Evidence: Mixed Methods Inference

	Quantitative evidence	Qualitative findings	Mixed methods inference
Prevalence of ASGM employment statuses	High degrees of waged labour (30%) and of waged activities combined with self-employment (67%). 95% of females were engaged in waged ASGM activities.	Waged employment yields steadier (daily) but lower incomes than self-employed digging. The former is preferred by poorer households. Self-employment requires capital; thus, many are dependent on local middlemen who demand exploitative conditional loans. Self-employment allows more freedom and higher returns.	Qualitative evidence complements labour survey data by outlining the reasoning as well as structural aspects for engaging in a specific employment status. Qualitative evidence highlights that employment statuses are fluid.
Incomes of distinct ASGM jobs and employment statuses	Marked degree of income heterogeneity: Processing tasks yield low incomes (on average US$35); mainly pursued by females. Digging pays US$62/month on average: waged digging pays US$53 while self-employed digging pays US$74. Trading (US$284) and sponsoring (US$131) yield the highest average incomes.*	Lack of capital restricts many from engaging in self-employed activities which yield higher incomes. Access to ASGM tasks linked to higher income levels is restricted to males only.	ASGM's income heterogeneity affects individuals differently. Within specific jobs such as digging, waged activities yield lower incomes than self-employed work.

Note. Source: Own data. *However, the number of observations is too small to generalise these incomes.

As examined in Chapter 7, both quantitative and qualitative methods of analysing poverty reported marked levels of ongoing poverty and no differences between mining and non-mining households across both case study sites could be observed. This chapter found that ASGM incomes are heterogeneous and that for certain groups, such as female ASGM processors and, to a lesser extent for waged male diggers, ASGM yields low incomes. Even though Section 8.2.1 confirmed previous findings on PSAs (Bryceson & Jønsson, 2010; Jønsson & Fold, 2009), the chapter

underlines that ASGM incomes vary according to locality, the type of labour task, and employment status.

Evidence that some jobs are associated with low wages in rural waged and self-employed work, and their link to marked deprivation, has been reported elsewhere. Sender et al. (2018) report for Ethiopia and Uganda that workers from the 'most deprived' households are particularly likely to engage in waged farming. Their finding, combined with evidence on Rwanda by Erlebach (2006) discussed in Section 2.3, underlines that the poorest rural households are pushed into waged employment and face low wages. My findings on female ASGM processing workers lend voice to this argument.

Yet, waged activities are not the only ones subject to insecurity; self-employment is also. Miners' lack of capital and decent mining equipment creates dependencies on local middlemen and exploitative loans as access to formal credit is scarce. At the same time, government measures designed to reduce informal finance, and promote formal finance instead, might lead to mixed outcomes for self-employed miners, as many do not have any tangible assets which can be used as collateral. Varying between self and waged employment is one strategy to deal with these challenging circumstances as "to find a piece of land, and to develop your own mining pit is very hard" (interview with Digger 9, 2019).

The internal heterogeneity across distinct classes of ASGM labour partly speaks to B. Verbrugge's (2014, 2015) research on the Philippines and its argument that a dominant stratum of casual, poverty-driven, day labourers and a small fraction of entrepreneurially driven self-employed actors coexists. My research similarly highlights the existence of heterogeneous welfare outcomes for households engaged in ASGM. On balance, it avoids the narrative of ASM as being overall poverty-reducing (Fisher et al., 2009) and a romanticised understanding of small holder agency in the sector (Lahiri-Dutt, 2018). Instead, the thesis can be read as an entry point to the study of ASM through the lens of distributional, context-specific, labour market outcomes. It underlines that ASM's impact is mediated, but also constrained, by a household's structural position in these sectoral labour markets.

More broadly my findings lend support to previous research on income heterogeneity in the informal economy. One example is the findings by Roever and

Rogan (2016) covering street vendors, home-based workers, and waste pickers.[153] They found an income gap of around 55% in favour of home-based own-account compared to sub-contracted workers, but also that only 29% were own-account and 71% sub-contracted workers. Moreover, cooperatives substantially increased earnings, as among waste pickers cooperative members earned around four times as much as own-account workers. Likewise, female workers, similar to this research's findings, were structurally disadvantaged in terms of incomes, earning on average less than two-thirds of the median earnings. With respect to my findings of the link between conditional loans and advance sales and how this renders ASGM workers more vulnerable, Roever and Rogan (2016) also found that 35% of home-based workers had to accept the prices offered by local middlemen, mostly men, who held an information advantage. This confirms this research's findings of how power asymmetries between ASGM workers and mineral traders affect distributional outcomes.

[153] Their analysis is based on the 2012 Informal Economy Monitoring Study (IEMS), which contains qualitative and quantitative information.

Conclusion

This final chapter presents the overall conclusions of this thesis. It begins by restating the thesis's research questions and linking them to the main findings. Subsequently, it discusses some of the findings' limitations and links these to a brief discussion of avenues of future research. It concludes by analysing the policy implications of these findings.

Objectives, Research Questions and Methodology

The thesis began by surveying the resource curse literature and contended that cross-country studies underexplore the different ways in which a country's political economy and history affect the outcomes of resource extraction. It argued that applying large datasets to search for generalisable solutions does not help to understand why resource extraction is, or is not, poverty-reducing. For this reason, the thesis zoomed in on a specific type of resource extraction: ASGM in Tanzania, and linked scholarship on ASM to the literature on the differences between and structure of rural labour markets. It asserted that labour markets play an important role in explaining the outcomes of rural differentiation and that understanding the internal logics of rural ASM labour markets constitutes the "missing link" (Mueller, 2015, p. 164) in the discourse of ASM and its link to poverty reduction. Thus, its main objective was to scrutinise the ways in which ASGM labour markets affect poverty outcomes.

To this end, it explored two case study areas in northwest Tanzania asking: to what extent and how have different modes of accumulation in Tanzania's ASGM sector led to sustainable poverty reduction for rural households over time? To this end, this research, grounded in context-specific mixed methods fieldwork, developed the following set of operational research questions:

1. Who gets what? This was aimed at unpacking how households in both case study areas are faring, to what degree they find themselves in deprived circumstances, and to what degree ASGM facilitates escaping poverty;
2. Who owns what? This was aimed at understanding the dynamics of social differentiation caused by varying property regimes;

3. Who does what? This was aimed at analysing how labour processes are organised and how social division among labour tasks emerges;
4. How did the balance of power between contending social groups and/or classes in ASGM alter over time? This was aimed at exploring who profited from changing distributional patterns and how did the domestic power structure change? What is the role of politicians and elites in shaping the mode of accumulation in the sector?

The thesis answered Questions 1 and 2 by examining household survey and qualitative data in Chapters 6 and 7. Question 3 was addressed through my labour force survey combining data on incomes and types of labour with qualitative interviews in Chapter 8. All three questions were couched in Question 4 concerning the political economy of the sector. Chapter 6 combined a historical with a political economy lens while also adding interview data. Question 4 was readdressed in Chapters 7 and 8 by analysing local power dynamics and structural aspects.

As highlighted in Chapter 3, the choice of a specific research method is always connected to a researcher's own belief system and positionality. Thus, the thesis aimed to present the reasons for opting for a specific method and its ontological foundations as transparently as possible. For example, my perception of the limitations of quantitative only poverty research, and its external understanding of poverty, motivated this research to integrate respondent views, through qualitative research, into the fieldwork. Therefore, in order to deepen the findings of my labour force survey, the empirical analysis integrated semi-structured interviews as well as fieldwork observations into the picture. Such mixed method research was decisive in capturing the heterogeneity and varying outcomes for households engaged in ASM. This also helped in the analysis of the role of distinct types of ASGM jobs and employment statuses in poverty reduction.

Key Findings

This thesis had three, and interrelated, findings. A first finding was that poverty at both case study mining settlements, as measured through quantitative research, remained high and, to some degree, had even increased since earlier studies. This was triangulated through qualitative interviews which integrated respondent perceptions of ASGM's impact on their economic situation. Food and basic needs poverty, measured

by expenditure data in 2019, was six and eight percentage points, respectively, higher than the 2004 indicators reported by Mwaipopo et al. (2004). The 2019 numbers were also higher than the national data from 2017/18 on rural household poverty suggest. Moreover, an assessment of poverty in the area based on an asset index highlighted that assets, a potential insurance against financial shocks and ill-health, are scarce, and that many households that live in monetary poverty are also asset poor. My quantitative poverty assessment further indicated that ASGM households fare as badly as non-ASGM households with respect to different poverty measures.

Digging deeper by analysing the qualitative evidence on poverty, the thesis argued that for the majority of respondents (16 out of 23), ASGM incomes allowed them to cover the expenses of basic subsistence but not to escape from living in poverty. This was based on three interrelated reasons. First, three-quarters of respondents (12 out of 16) reported that incomes were low and that this prevented them from 'climbing up the ladder' and improving their socioeconomic status. Second, incomes were volatile, leading to high levels of economic insecurity. For this reason, many respondents highlighted the need to diversify their income sources but also their inability to do so. Third, respondents relied on local and informal sources of finance to be able to engage in self-employed digging. In return, local sponsors had first refusal to buy whatever gold they might find at below-market prices. This conditionality of informal finance reinforced existing inequalities.

A second finding was that working for a wage in ASM is much more common than both official data on rural labour markets in SSA and the ASM literature indicate. Waged employment and a hybrid strategy consisting of self- and waged employment accounted for 29.75% and 36.36%, respectively, of ASGM employment statuses. Overall, around 67% of the sampled ASGM labour force engaged in casualised and insecure forms of waged labour, which is significantly higher than the 15% found by the most recent Tanzanian labour survey (URT, 2014a). Thus, conventional labour survey data such as the 2006 and 2014 ILFS, which are not adjusted to regional and occupational contexts, insufficiently reflect the heterogeneity in distinct rural labour markets. Likewise, with respect to the ASM literature, although scholars have argued that miners change their occupation over time and space (Jønsson & Fold, 2009) and that individuals at the top of the sector's occupational ladder are more mobile than

workers at lower levels (Jønsson & Bryceson, 2009), they have been rather silent on the prevalence and role of different employment statuses in ASM.

Adding to this, my qualitative analysis examined the reasons why respondents, constrained by their labour market position, chose, and alternated between self- and waged employment. Interviewees highlighted that being day-to-day wage employed in ASM has twofold implications. On the one hand, waged ASGM activities allowed the majority of respondents to earn daily, and more stable, incomes compared to self-employed activities which were perceived as uncertain. On the other hand, given the work environment of casual employment, where labour conditions and wages are at the whim of the employer, many felt particularly vulnerable. Likewise, respondents described self-employment as desirable, as they are not exposed to the whim of a labour contractor such as the pit manager. At the same time, self-employment was much riskier as its incomes were barely predictable. Higher productivity of a neighbouring pit, or ongoing low productivity of their own pit, led respondents to switch from self- to waged employment. Thus, self-employed miners reported that they worked at neighbouring pits to generate incomes until their own pits started producing. This is linked to another reason for engaging in waged labour: a shortage of capital to finance self-employment. Self-employed diggers had to rely on external capital sources, creating dependencies on sponsors. Both the high levels of waged employment and the fluidity with which individuals shifted from self- to waged-employment or engaged in mixed-forms, underscore the significance of ASGM labour markets to the livelihoods of rural dwellers.

A third finding was that both the type of ASGM job and the type of employment status affected individuals' incomes. The average income of my sample covering *all* types of ASGM workers (US$69) contrasts with existing data centred only on *diggers*' incomes which reports average monthly incomes of between US$90 and US$150 (Bryceson et al., 2014; Jønsson & Bryceson, 2009; Lange, 2006; Merket, 2019). Disaggregated by jobs, this research found average incomes for diggers of US$62 and for processing workers of US$35.50, while a few individuals – owners of ball mills and processing plants, gold traders or sponsors – earned much more. The thesis argued that this gap in ASGM average incomes is explained by the omission of ASGM processing tasks when reporting sectoral averages. Looking at all types of ASGM activities, the

thesis found an average monthly income of US$69 which is 56% to 27% lower than the incomes reported by Bryceson et al. (2014), Jønsson and Bryceson (2009) Lange (2006), and Merket (2019). The thesis further contended that the type of employment status also affects diggers' income levels. A self-employed miner earned around US$68, while waged as well as waged- and self-employed diggers earned US$53 and US$56, respectively. Thus, self-employment yielded significantly higher incomes.

Then, drawing on Bernstein (2007, 2010), the thesis translated this heterogeneity of ASGM incomes into a more structural analysis in the form of different 'classes of ASGM labour'. A first 'class of labour' was defined as consisting of waged ASGM processing workers (the majority of them female) with below-average incomes, earning on average around US$35/month. Importantly, within this group incomes varied by task: collectors earned US$41 while crusher made on average US$30. A second 'class of labour' consisted of casual waged diggers who accrued higher incomes than processing workers, on average US$53. A third 'class of labour', those diggers who combined waged- and self-employed activities, earned higher incomes than waged diggers: on average, US$57. This group either engaged in waged activities to obtain an income while developing their own pit or opted for waged work during periods when their developed pit was not yielding ore. A fourth and final 'class of labourers', consisting of self-employed workers, earned around US$68 on average. These figures underline that a binary understanding of self- and waged employment does not capture either the complex employment realities of miners or the heterogeneity within the group of waged workers.

Bringing together all the above, the thesis argues that ASM processing workers and waged diggers are located in highly insecure waged employment which has not helped to lift them out of poverty. In particular, processing tasks yield significantly lower incomes than digging and thus need to be integrated when examining local outcomes of resource extraction. Given these highly heterogeneous labour market outcomes, the thesis avoids an overly romantic understanding of ASGM workers as "actively shaping their own environment" (Geenen & B. Verbrugge, 2020, p. 81) as well as the reading of mining as a derivate of agrarian, smallholder livelihoods (Geenen & B. Verbrugge, 2020). It thus questions the optimistic narrative of ASM as an engine for poverty reduction and instead argues that the majority of individuals in the sector are, in fact, unable to access the higher income strata that previous research has

suggested. As a consequence, this research understands ASGM labour markets as sites of both micro-accumulation and conflict in contemporary capitalism. Moreover, it challenges existing knowledge on ASGM's impact on poverty reduction in Tanzania and in SSA more generally (Fisher et al., 2009; Mwaipopo et al., 2004; Pokorny et al., 2019; World Bank, 2012) by arguing that the heterogeneity of outcomes for different types of ASGM workers and thus the sector's ability for poverty-reduction have been under-analysed.

Limitations and Future Research

Any research is subject to limitations in scope and depth and this thesis is no exception to this. The following section discusses its distinct limitations jointly with an elaboration of the most pressing issues for future research. First, the study's design is grounded in a spatially-defined context and thus my findings speak to the *specific* conditions encountered at both case study locations. Given that the scope of the survey is restricted to two particular wards in Northwest Tanzania and draws on a limited number of interviews, the reported findings are specific to the context of both case studies. Thus, one should be cautious when considering extrapolating the income and poverty levels found at either case study site to other ASGM communities and to structurally distinct political economy settings. This is because the particular structure of each labour market, such as the existence of a miners association and/or public mining land, affected PSAs in distinct ways as well as because of location specific political economy features.

Despite this limited generalisability of my empirical results to other types of minerals and/or locations, future research might profit from the theoretical considerations and the empirical approach adopted by this thesis. It promoted the inclusion of both quantitative and qualitative poverty measures to assess ASM's ability to reduce poverty and to create wealth for different types of workers. Moreover, the thesis argued that employment statuses cannot be understood purely as binary and included a third category of waged *and* self-employed workers. Some of its findings, such as the high level of waged labour and the low average incomes of processing tasks –might be of methodological value for further studies on poverty and ASM labour markets. Moreover, this research highlighted the need to integrate power and social relations into analyses of sectoral and context-specific labour in future ASM research.

Second, even though the thesis provides a longitudinal perspective by comparing my 2019 survey data to data from 2004 by Mwaipopo et al. in the same area, it was unable to trace households over time and thus to infer causal inference of how ASM shaped poverty. As discussed, gathering panel data is an intricate task, given that ASM households are highly mobile and thus difficult to track. Heeding the call by previous research (Fisher et al., 2009), future research might collect panel data which focuses on ASM employment statuses and incomes, and how each links to the type of ASM job held. Such panel data might allow a scrutiny of statistical inference given the larger number of observations. Moreover, analysing minerals other than gold, as well as other areas in Tanzania, could corroborate and enrich this thesis' findings.

Third, the thesis' scope is limited as ASM requires multidimensional policy answers. Although the thesis highlighted ASM's close ties to other developmental issues such as health, environment, education, and child labour, it did not have the space to discuss these important linkages in more detail. Likewise, Chapter 8 outlined the gendered nature of incomes and their structural disadvantages and how the nature of the job means that processing workers are exposed to potential mercury poisoning and respiratory diseases. Likewise, the Covid-19 pandemic has left its mark, not only by increasing global poverty, but also on ASM communities (Lakner et al., 2020). A survey from July 2020 covering 22 countries with sizeable ASM populations found that for 42% of ASM workers their access to food had worsened (Perks & Schneck, 2021). This comes as no surprise as the informal labour force is usually hit the hardest by such external shocks, as they have the most limited means (e.g., assets, a social safety or quality healthcare system, or savings) to fall back on (Franz, 2020). Thus, future research, with a more extensive budget, might analyse the longitudinal effects of the Covid-19 pandemic on ASM populations.

Last, future research might analyse if and how different 'classes' of ASGM labour are able to resist pressures in the informal economy through collective action. As highlighted by Mezzadri and Fan (2018), informal workers are able to negotiate their work conditions through different acts of resilience which vary according to their relative position in the production and/or reproductive structure. Moreover, recent research on informal urban transport workers by Rizzo and Atzeni (2020) reported that workers in Dar es Salaam created a savings fund, while in Buenos Aires they supported each other in case of mechanical problems. Thus, it might be worthwhile to scrutinise

the ways in which informal ASGM workers, outside of the realm of trade unions, organise themselves and their respective strategies.

Policy Recommendations

As highlighted in Chapter 5, the 2017 amendments aimed to modify Tanzania's mining codes to regain sovereignty. However, the 2017 amendments, consistent with the 2010 Mining Act, neither addressed nor formalised the practice of subleasing. Consequently, the 2017 amendments conformed to the logic of former mining codes and the marked gap between actual organisational practices and Tanzania's existing legal framework persisted. The latest policy actions by the current President, Suluhu Hassan, indicate a reversal of policies towards embracing LSM investments. However, it remains to be seen if President Hassan will approach ASM more holistically from a development viewpoint, which would entail integrating ASM in existing labour legislation and advancing formalisation processes.

These distinct policies are part of the larger question of to what degree the state should control mineral extraction and its revenues. In this context, two contrasting policy paths are evident. On the one hand, the idea to temporarily protect imports while developing a domestic mineral supply chain which would create 'good' – high value-added – jobs which would strengthen Tanzania's economic performance and create more policy space (Andreoni & Chang, 2016; Chang, 2004). This was the route pursued by Magufuli's government from 2015–2021. On the other hand, free trade promoters and opponents of resource nationalism claimed that Tanzania does not have the required smelting and refining capacities to add the intended added value to its economy and that a strategy of stockpiling minerals is inefficient and thus will not be followed by foreign companies (*The Economist*, 2017). Here, the thesis argued that labour markets are of particular importance regarding if, and how, ASM incomes allow households to improve economically.

In this regard, the thesis has argued that the type of ASM employment relationship an individual is in shapes both the constraints and the opportunities she/he will face. Drawing on Mueller and Man-Kwun Chan (2015), an empirically grounded understanding of prevailing employment relations, not only in ASGM in Tanzania, but also more generally of rural economies in the Global South is vital for designing well-suited policy mechanisms. Thus, a clear understanding of employment relations – the

relative share of waged versus self-employed activities – and their incentive structure, is essential when crafting support schemes aiming to improve living standards. A waged individual might benefit from the enforcement of labour and safety regulations, and higher and more predictable wages, compared to better access to finance, markets, and technical and business training schemes for a self-employed miner (Mueller & Man-Kwun Chan, 2015). Knowing the type of employment is thus a precondition to effectively programming support schemes to improve ASM productivity and hence to reduce poverty.

As noted, around 67% of workers across both sites were waged. Given the informal environment of employed ASGM work, their labour conditions and wages were dictated by their employers and many interviewees explained how this made them vulnerable. ASM policies ought to reflect the needs of this substantial group, which has been neglected to date by assuming that waged labour is of minor importance in ASM. For instance, prospective policy solutions might be to establish a higher minimum wage floor and to enforce existent law. At the moment, the minimum monthly wage in Tanzania's mining sector stands at TZS150,000 which is around US$66. Yet, as outlined in Section 5.5, interviewees described government capacities as scant and labour officers rarely visiting remote ASM grounds. Thus, enforcing existing law might be a first step. Moreover, monitoring and publishing wage rates as well as skills training for labourers might be an important policy avenue (Sender et al., 2018).

A final aspect might be to strengthen and formalise local finance. As highlighted in Chapters 7 and 8, the pre-finance schemes which existed in both labour markets deepened existing asymmetries in terms of bargaining power and thus strongly affected distributional outcomes. Likewise, as argued in Chapter 8, most individuals living in poverty in the Global South do not have the cash-reserves and/or incomes to open formal lines of credit. As outlined above, the solution cannot be further financialisation, which then might accelerate household indebtedness, but instead a higher minimum wage floor. It is only when policy makers acknowledge the heterogeneous distributional outcomes in ASM labour markets as well as addressing holistically the health, environmental, labour and gender issues linked to ASM, that ASGM might allow broader livelihood improvements. Both render adjusting Tanzania's mining codes and enforcing its labour codes necessary.

References

Abreu, A. J. G. de. (2012). *Migration and development in contemporary Guinea-Bissau: A political economy approach* [Doctoral dissertation]. SOAS, University of London.

Ackah-Baidoo, A. (2013). Fishing in troubled waters: Oil production, seaweed and community-level grievances in the western region of Ghana. *Community Development Journal*, *48*(3), 406–420. https://doi.org/10.1093/cdj/bst022

ACT Wazalendo. (2020, October 29). *ACT Wazalendo post election briefing: 29 October 2020*. ACT Wazalendo.

Adams, W. M., & Megaw, C. C. (1997). Researchers and the rural poor: Asking questions in the Third World. *Journal of Geography in Higher Education, 21*(2), 215–229. https://doi.org/10.1080/03098269708725426

Adato, M., Carter, M. R., & May, J. (2006). Exploring poverty traps and social exclusion in South Africa using qualitative and quantitative data. *Journal of Development Studies*, *42*(2), 226–247. https://doi.org/10.1080/00220380500405345

Adu, G., Amuakwa-Mensah, F., Marbuah, G., & Mensah, J. T. (2016). *Effect of gold mining on income distribution in Ghana* (Issue 2016.23). FAERE - French Association of Environmental and Resource Economists. https://ideas.repec.org/p/fae/wpaper/2016.23.html

Agarwal, B. (1997). Bargaining and gender relations: Within and beyond the household. *Feminist Economics*, *3*(1), 1–51. https://doi.org/10.1080/135457097338799

A'Hearn, B., Baten, J., & Crayen, D. (2009). Quantifying quantitative literacy: Age heaping and the history of human capital. *The Journal of Economic History, 69*(3), 783–808. https://doi.org/10.1017/S0022050709001120

Ahlerup, P., Baskaran, T., & Bigsten, A. (2016). *Gold mining and education: A long-run resource curse in Africa?* University of Gothenburg, Department of Economics. https://ideas.repec.org/p/hhs/gunwpe/0666.html

Al Jazeera. (2020, June 9). *Tanzania opposition leader attacked months before the elections*. https://www.aljazeera.com/news/2020/6/9/tanzania-opposition-leader-attacked-months-before-the-elections

Alderman, H., Chiappori, P.-A., Haddad, L., Hoddinott, J., & Kanbur, R. (1995). Unitary versus collective models of the household: Is it time to shift the burden of proof? *The World Bank Research Observer*, *10*(1), 1–19. https://doi.org/10.1093/wbro/10.1.1

Amsden, A. H. (2010). Say's law, poverty persistence, and employment neglect. *Journal of Human Development and Capabilities*, *11*(1), 57–66. https://doi.org/10.1080/19452820903481434

Andersson, M., Punam Chuhan-Pole, Dabalen, A. L., Land, B. C., Sanoh, A., Smith, G., Tolonen, A. K., Aragaon, F., Kotsadam, K. A., Hall, O., & Olén, N. (2015). *Socioeconomic impact of mining on local communities in Africa*. World Bank Working Paper. https://doi.org/10.13140/RG.2.1.1357.7446

Andreoni, A. (2017a). *Anti-corruption in Tanzania: A political settlements analysis*. ACE Working Paper.

Andreoni, A. (2017b). *Mapping industrial production in Tanzania A disaggregated analysis based on the 2013 mainland census*. Inclusive and Sustainable Industrial Development Working Paper Series WP 12 | 2017.

Andreoni, A., & Chang, H.-J. (2016). Bringing production and employment back into development: Alice Amsden's legacy for a new developmentalist agenda. *Cambridge Journal of Regions, Economy and Society*, *10*(1), rsw029. https://doi.org/10.1093/cjres/rsw029

Aragón, F. M., & Rud, J. P. (2013). Natural resources and local communities: Evidence from a Peruvian gold mine. *American Economic Journal: Economic Policy*, *5*(2), 1–25. https://doi.org/10.1257/pol.5.2.1

Arndt, C., Tarp, F., & World Institute for Development Economics Research (Eds.). (2017). *Measuring poverty and wellbeing in developing countries* (First edition). Oxford University Press.

Arrow, K. J. (1978). *Social choice and individual values* (2. ed., 9. printing). Yale University Press.

Ashly, J. (2020, December 17). Tanzania: Remembering ujamaa, the good, the bad and the buried. *African Arguments*. https://africanarguments.org/2020/12/tanzania-remembering-ujamaa-the-good-the-bad-and-the-buried/

Auty, R. M. (1993). *Sustaining development in mineral economies: The resource curse thesis*. Routledge.

Auty, R. M. (2001). The political economy of resource-driven growth. *European Economic Review*, *45*(4–6), 839–846. https://doi.org/10.1016/S0014-2921(01)00126-X

Auty, R. M. (2006). *Patterns of rent-extraction and deployment in developing countries*. *2006*(016).UNU-WIDER.

Babatunde, R. (2013). *On-farm and off-farm works: Complement or substitute? Evidence from rural Nigeria*. Fourth International Conference, Hammamet, Tunisia. https://doi.org/10.22004/ag.econ.160437

Backiny-Yetna, P. (2003). *Labour statistics in Afristat member states: Summary of the situation* [Expert Group Meeting on Setting the Scope of Social Statistics]. United Nations Statistics Division.

Badeeb, R. A., Lean, H. H., & Clark, J. (2017). The evolution of the natural resource curse thesis: A critical literature survey. *Resources Policy*, *51*, 123–134. https://doi.org/10.1016/j.resourpol.2016.10.015

Bainton, N. A. (2008). The genesis and the escalation of desire and antipathy in the Lihir Islands, Papua New Guinea. *The Journal of Pacific History*, *43*(3), 289–312. https://doi.org/10.1080/00223340802499609

Baldwin, R. E. (1966). *Economic development and export growth: A study of northern Rhodesia, 1920-1960*. University of California Press. https://books.google.de/books?id=-4tEAAAAIAAJ

Banchirigah, S. M. (2006). How have reforms fuelled the expansion of artisanal mining? evidence from sub-Saharan Africa. *Resources Policy*, *31*(3), 165–171. https://doi.org/10.1016/j.resourpol.2006.12.001

Banchirigah, S. M. (2008). Challenges with eradicating illegal mining in Ghana: A perspective from the grassroots. *Resources Policy*, *33*(1), 29–38. https://doi.org/10.1016/j.resourpol.2007.11.001

Banchirigah, S. M., & Hilson, G. (2010). De-agrarianization, re-agrarianization and local economic development: Re-orientating livelihoods in african artisanal mining communities. *Policy Sciences*, *43*(2), 157–180. https://doi.org/10.1007/s11077-009-9091-5

Banerjee, A. V., & Duflo, E. (2007). The economic lives of the poor. *Journal of Economic Perspectives*, *21*(1), 141–167. https://doi.org/10.1257/jep.21.1.141

Bank of Tanzania. (n.d.). *Annual Report 2010/11*.

Bank of Tanzania. (2006). *Annual Report 2005/6*.

Bank of Tanzania. (2008). *Annual Report 2007/8*.

Bank of Tanzania. (2010). *Annual Report 2008/09*.

Bank of Tanzania. (2011). *Annual Report 2011/12*.

Bank of Tanzania. (2014). *Annual Report 2014/15*.

Bank of Tanzania. (2020). *Annual Report 2019/20*.

Banks, G. (2007). Mining, social change and corporate social responsibility: Drawing lines in the Papua New Guinea mud. In S. Firth (Ed.), *Globalisation and governance in the Pacific islands: State, society and governance in Melanesia* (pp. 259–274). ANU Press.

Banks, G. (2009). *Activities of TNCs in extractive industries in Asia and the Pacific: Implications for development* (Transnational Corporations No. 18; pp. 43–59).

Banks, J., & Johnson, P. (1993). *Children and household living standards*. The Institute for Fiscal Studies. https://doi.org/10.1920/re.ifs.1993.0042

Barrett, C. B., Reardon, T., & Webb, P. (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics, and policy implications. *Food Policy*, *26*(4), 315–331. https://doi.org/10.1016/S0306-9192(01)00014-8

Barry, M. (1996). *Regularizing informal mining: A summary of the proceedings of the International Roundtable on Artisanal Mining (17-19 May 1995)* (pp. 1–27). World Bank. http://documents.worldbank.org/curated/en/509771468767381318/pdf/multi-page.pdf

Bazillier, R., & Girard, V. (2017). The gold digger and the machine. Evidence on the distributive effect of the artisanal and industrial gold rushes in Burkina Faso. *LEO Working Papers*, *2545*, 53.

BBC. (2020, November 2). Tanzania elections: Chadema's Freeman Mbowe arrested. *BBC News*. https://www.bbc.com/news/world-africa-54777226

Becker, G. S. (1965). A theory of the allocation of time. *The Economic Journal*, *75*(299), 493–517. https://doi.org/10.2307/2228949

Becker, G. S. (1981). *A treatise on the family*. National Bureau of Economic Research, Inc. https://EconPapers.repec.org/RePEc:nbr:nberbk:beck81-1

Bennett, S., Woods, T., Liyanage, W. M., & Smith, D. L. (1991). A simplified general method for cluster-sample surveys of health in developing countries. *World Health Statistics Quarterly*, *44*(3), 98–106.

Bergmann, B. (1995). Becker's theory of the family: Preposterous conclusions. *Feminist Economics*, *1*(1), 141–150. https://doi.org/10.1080/714042218

Berik, G. (1997). The need for crossing the method boundaries in economics research. *Feminist Economics*, *3*(2), 121–125. https://doi.org/10.1080/135457097338735

Berman, B. J., & Lonsdale, J. M. (1980). Crises of accumulation, coercion and the colonial state: The Development of the labor control system in Kenya, 1919-1929. *Canadian Journal of African Studies / Revue Canadienne Des Études Africaines*, *14*(1), 55. https://doi.org/10.2307/484278

Bernstein, H. (2007). *Capital and labour from centre to margins*. Prepared for the Living on the Margins Conference, Stellenbosch, South Africa.

Bernstein, H. (2010a). *Class dynamics of agrarian change*. Fernwood Pub. ; Kumarian Press.

Bernstein, H. (2010b). Rural livelihoods and agrarian change: Bringing class back in. In *Rural transformations and development—China in context: The everyday lives of policies and people* (pp. 79–109). Elgar.

BGC, & KMCL. (1999). *Social development plan for Bulyanhulu gold mine*. United Republic of Tanzania.

Biles, J. J. (2008). Informal work and livelihoods in Mexico: Getting by or getting ahead? *The Professional Geographer*, *60*(4), 541–555. https://doi.org/10.1080/00330120802288743

Biles, J. J. (2009). Informal work in Latin America: Competing perspectives and recent debates. *Geography Compass*, *3*(1), 214–236. https://doi.org/10.1111/j.1749-8198.2008.00188.x

Binswanger, H., McIntire, J., & Udry, C. (1989). Production relations in semi-arid African agriculture. In P. Bardhan (Ed.), *The economic theory of agrarian institutions* (Reprinted, pp. 122–144). Clarendon Press.

Birdsall, N., Pinckney, T., & Sabot, R. (2004). Natural resources, human capital and growth. In R. M. Auty (Ed.), *Resource abundance and economic development* (pp. 57–75). Oxford University Press. https://doi.org/10.1093/0199275785.001.0001

Bloch, R., & Owusu, G. (2012). Linkages in Ghana's gold mining industry: Challenging the enclave thesis. *Resources Policy*, *37*(4), 434–442. https://doi.org/10.1016/j.resourpol.2012.06.004

Bloomberg. (2021, April 6). *Tanzania President Samia Hassan signals u-turn on Magufuli's covid policy*. https://www.bloomberg.com/news/articles/2021-04-06/tanzania-s-new-president-signals-u-turn-on-coronavirus-policy

Booth, A. (2003). Decentralisation and poverty alleviation in Indonesia. *Environment and Planning C: Government and Policy*, *21*(2), 181–202. https://doi.org/10.1068/c0127

Booth, C. (1889). *Life and labour of the people in London*. Macmillan and Co.

Booysen, F., Van Der Berg, S., Burger, R., Von Maltitz, M., & Du Rand, G. (2008). Using an asset index to assess trends in poverty in seven Sub-Saharan African

countries. *World Development*, *36*(6), 1113–1130. https://doi.org/10.1016/j.worlddev.2007.10.008

Bourgouin, F. (2011). *Mining for sustainable development? What role for multinational mining corporations in resource -rich developing countries*.

Brand, U., & Dietz, K. (2014). (Neo-)Extraktivismus als Entwicklungsoption? Zu den aktuellen Dynamiken und Widersprüchen rohstoffbasierter Entwicklung in Lateinamerika. In C. Jakobeit, F. Müller, E. Sondermann, I. Wehr, & A. Ziai (Eds.), *Entwicklungstheorien: Weltgesellschaftliche Transformationen, entwicklungspolitische Herausforderungen, theoretische Innovationen* (1st ed., pp. 133–170). Nomos Verlagsgesellschaft GmbH & Co. KG. https://doi.org/10.5771/9783845250298_133

Brandolini, A., Magri, S., & Smeeding, T. M. (2010). Asset-based measurement of poverty. *Journal of Policy Analysis and Management*, *29*(2), 267–284. JSTOR. https://doi.org/10.1002/pam.20491

Breman, J. (1996). *Footloose labour: Working in India's informal economy*. Cambridge University Press.

Bromley, S., Wangwe, S., Mackintosh, M., Brown, W., & Wuyts, M. (Eds.). (2004). The politics of autonomy and sovereignty: Tanzania's aid relationship. In *Making the international: Economic interdependence and political order* (pp. 379–412). Pluto Press.

Brückner, M., & Ciccone, A. (2010). International commodity prices, growth and the outbreak of civil war in sub-Saharan Africa. *Economic Journal*, *120*(544), 519–534. https://doi.org/10.1111/j.1468-0297.2010.02353.x

Brunnschweiler, C. N., & Bulte, E. H. (2009). Natural resources and violent conflict: Resource abundance, dependence, and the onset of civil wars. *Oxford Economic Papers*, *61*(4), 651–674. https://doi.org/10.1093/oep/gpp024

Bryceson, D. F. (1996). Deagrarianization and rural employment in sub-Saharan Africa: A sectoral perspective. *World Development*, *24*(1), 97–111. https://doi.org/10.1016/0305-750X(95)00119-W

Bryceson, D. F. (Ed.). (1997). *Farewell to Farms: De-Agrarianisation and employment in Africa*. Ashgate.

Bryceson, D. F. (2000). African peasants' centrality and marginality: Rural labour transformations. In D. F. Bryceson, C. Kay, & J. Mooij (Eds.), *Disappearing peasantries?* (pp. 37–63). Practical Action Publishing. https://doi.org/10.3362/9781780440118.002

Bryceson, D. F. (2016). Beyond livelihoods: Occupationality and career formation in African artisanal mining. In K. Havenik, T. Oestigaard, E. Tobisson, & T. Virtanen, *Framing African development—Challenging concepts* (pp. 90–110). Brill. https://doi.org/10.1163/9789004305465_006

Bryceson, D. F., Fisher, E., Jønsson, J. B., & Mwaipopo, R. (2014). *Mining and social transformation in Africa: Mineralizing and democratizing trends in artisanal production*. Routledge.

Bryceson, D. F., & Geenen, S. (2016). Artisanal frontier mining of gold in Africa: Labour transformation in Tanzania and the Democratic Republic of Congo. *African Affairs*, *115*(459), 296–317. https://doi.org/10.1093/afraf/adv073

Bryceson, D. F., & Jønsson, J. B. (2010). Gold digging careers in rural East Africa: Small-scale miners' livelihood choices. *World Development*, *38*(3), 379–392. https://doi.org/10.1016/j.worlddev.2009.09.003

Bryceson, D. F., & Jønsson, J. B. (2014). Mineralizing Africa and artisanal mining's democratizing influence. In D. F. Bryceson, E. Fisher, J. B. Jønsson, & R. Mwaipopo (Eds.), *Mining and social transformation in Africa: Mineralizing and democratizing trends in artisanal production* (pp. 179–206). Routledge.

Bryceson, D. F., Jønsson, J. B., Kinabo, C., & Shand, M. (2012). Unearthing treasure and trouble: Mining as an impetus to urbanisation in Tanzania. *Journal of Contemporary African Studies*, *30*(4), 631–649. https://doi.org/10.1080/02589001.2012.724866

Bryceson, D. F., Jønsson, J. B., & Sherrington, R. (2010). Miners' magic: Artisanal mining, the albino fetish and murder in Tanzania. *The Journal of Modern African Studies*, *48*(3), 353–382. JSTOR. https://doi.org/10.1017/S0022278X10000303

Bryman, A. (1984). The debate about quantitative and qualitative research: A question of method or epistemology? *The British Journal of Sociology*, *35*(1), 75. https://doi.org/10.2307/590553

Bryman, A. (2012). *Social research methods* (4th ed). Oxford University Press.

Buccellato, T., & Mickiewicz, T. (2009). Oil and gas: A blessing for the few. Hydrocarbons and inequality within regions in Russia. *Europe-Asia Studies*, *61*(3), 385–407. https://doi.org/10.1080/09668130902753275

Buchanan, J. M., Tollison, R. D., & Tullock, G. (Eds.). (1980). *Toward a theory of the rent-seeking society* (1. ed). Texas A&M University Press.

Bulmer, M., & Warwick, D. P. (Eds.). (1993). *Social research in developing countries: Surveys and censuses in the Third World* (1. publ. in paperback). UCL Press.

Bulte, E. H., Damania, R., & Deacon, R. T. (2005). Resource intensity, institutions, and development. *World Development*, *33*(7), 1029–1044. https://doi.org/10.1016/j.worlddev.2005.04.004

Burchardt, H., & Dietz, K. (2014). (Neo-)extractivism – a new challenge for development theory from Latin America. *Third World Quarterly*, *35*, 468–486. https://doi.org/10.1080/01436597.2014.893488

Burchardt, T., Le Grand, J., & Piachaud, D. (1999). Social Exclusion in Britain 1991-1995. *Social Policy & Administration*, *33*(3), 227–244. https://doi.org/10.1111/1467-9515.00148

Burke, J. (2021, March 18). Tanzania's covid-denying president, John Magufuli, dies aged 61. *The Guardian*. http://www.theguardian.com/world/2021/mar/17/tanzanias-president-john-magufuli-dies-aged-61

Bursian, A. (1910). *Die Hauser- und Hüttensteuer in Deutsch-Ostafrika: Vol. Achter Band*. Gustav Fischer.

Bury, J. (2005). Mining mountains: Neoliberalism, land tenure, livelihoods, and the new Peruvian mining industry in Cajamarca. *Environment and Planning A*, *37*(2), 221–239. https://doi.org/10.1068/a371

Bush, R. (2009). Soon there will be no-one left to take the corpses to the morgue: Accumulation and abjection in Ghana's mining communities. *Resources Policy*, *34*(1–2), 57–63. https://doi.org/10.1016/j.resourpol.2008.02.002

Butler, P. (2004). Tanzania: Liberalisation of investment and the mining sector analysis of the content and certain implications of the Tanzania 1998 Mining Act. In B. K. Campbell (Ed.), *Regulating mining in Africa: For whose benefit?* (pp. 67–80). Nordiska Afrikainstitutet.

Byrne, D. (2009). Case-based methods: Why we need them; what they are; how to do them. In D. Byrne & C. Ragin (Eds.), *The SAGE Handbook of Case-Based Methods* (pp. 1–10). SAGE Publications Ltd. https://doi.org/10.4135/9781446249413

Calvert, A. F. (1917). *German East Africa*. T. Werner Laurie.

Campbell, B. (2003). Factoring in governance is not enough. Mining codes in Africa, policy reform and corporate responsibility. *Minerals & Energy - Raw Materials Report*, *18*(3), 2–13. https://doi.org/10.1080/14041040310019129

Campbell, B. (2006). Good governance, security and mining in Africa. *Minerals & Energy - Raw Materials Report*, *21*(1), 31–44. https://doi.org/10.1080/14041040600575813

Caracelli, V. J., & Greene, J. C. (1997). Crafting mixed-method evaluation designs. *New Directions for Evaluation*, *1997*(74), 19–32. https://doi.org/10.1002/ev.1069

Carter, M. R., & Katz, E. L. (1997). Separate spheres and the conjugal contract: Understanding the impact of gender-biased development. In L. J. Haddad, J. Hoddinott, H. Alderman, & International Food Policy Research Institute (Eds.), *Intrahousehold resource allocation in developing countries: Models, methods, and policy* (pp. 95–111). Johns Hopkins University Press.

Cartier, L. E., & Bürge, M. (2011). Agriculture and artisanal gold mining in Sierra Leone: Alternatives or complements? *Journal of International Development*, *23*(8), 1080–1099. https://doi.org/10.1002/jid.1833

Caselli, F., & Michaels, G. (2013). Do oil windfalls improve living standards? Evidence from Brazil. *American Economic Journal: Applied Economics*, *5*(1), 208–238. https://doi.org/10.1257/app.5.1.208

Chachage, C. S. L. (1995). The meek shall inherit the Earth but not the mining rights: Mining and accumulation in Tanzania. In P. Gibbon & A. S. Z. Kiondo (Eds.), *Liberalised development in Tanzania: Studies on accumulation processes and local institutions*. Nordiska Afrikainstitutet.

Chambers, R. (1983). *Rural development: Putting the last first* (1.). Routledge.

Chang, H.-J. (2004). Regulation of foreign investment in historical perspective. *The European Journal of Development Research*, *16*(3), 687–715. https://doi.org/10.1080/0957881042000266660

Chayanov, A. V. (1986). *The theory of peasant economy*. The University of Wisconsin Press.

Cheeseman, N. (2016). *Like others, Tanzania's Magufuli is bound to fail*. http://www.nation.co.ke/oped/opinion/like-others-magufuli-bound-to-fail/440808-3417964-10i6pjkz/index.html

Chen, M. (2008). Informality and social protection: Theories and realities. *IDS Bulletin*, *39*(2), 18–27. https://doi.org/10.1111/j.1759-5436.2008.tb00441.x

Chenery, H. B. (1979). *Structural change and development policy*. Published for the World Bank [by] Oxford University Press.

Chernomas, R., & Hudson, I. (2019). Omission and commission in the development economics of Daron Acemoglu and Esther Duflo. *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement*, *40*(4), 447–463. https://doi.org/10.1080/02255189.2019.1682976

Childs, J. (2008). Reforming small-scale mining in sub-Saharan Africa: Political and ideological challenges to a fair trade gold initiative. *Resources Policy*, *33*(4), 203–209. https://doi.org/10.1016/j.resourpol.2008.08.002

Collier, P. (1998). On economic causes of civil war. *Oxford Economic Papers*, *50*(4), 563–573. https://doi.org/10.1093/oep/50.4.563

Collier, P., & Hoeffler, A. (2005). Resource rents, governance, and conflict. *Journal of Conflict Resolution*, *49*(4), 625–633. https://doi.org/10.1177/0022002705277551

Collord, M. (2017, November 19). *Tanzania – Where President Magufuli's politics and his economics meet*. http://democracyinafrica.org/tanzania-president-magufulis-politics-economics-meet/#_ftn1

Cooksey, B. (2011). *The investment and business environment for gold exploration and mining in Tanzania* (Background Paper No. 3; Africa Power and Politics Programme). ODI. http://www.institutions-africa.org/filestream/20121217-the-investment-and-business-environment-for-gold-exploration-and-mining-in-tanzania

Cooksey, B., & Kelsall, T. (2011). *The political economy of the investment climate in Tanzania* (Research Report No. 1; APPP Research Report Series). Africa Power and Politics Programme (APPP).

Corden, W. M. (1984). Booming sector and Dutch disease economics: Survey and consolidation. *Oxford Economic Papers*, *36*(3), 359–380. https://doi.org/10.1093/oxfordjournals.oep.a041643

Corden, W. M., & Neary, J. P. (1982). Booming sector and de-industrialisation in a small open economy. *The Economic Journal*, *92*(368), 825. https://doi.org/10.2307/2232670

Coulson, A. (2013). *Tanzania: A political economy* (Second edition). Oxford University Press.

Cramer, C., Johnston, D., Mueller, B., Oya, C., & Sender, J. (2014a). How to do (and how not to do) fieldwork on fair trade and rural poverty. *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement*, *35*(1), 170–185. https://doi.org/10.1080/02255189.2014.873022

Cramer, C., Johnston, D., Oya, C., & Sender, J. (2014b). *Fairtrade, employment and poverty reduction in Ethiopia and Uganda* (p. 143) [Final report to DFID, with appendices]. SOAS, University of London. http://rgdoi.net/10.13140/2.1.1022.0804

Cramer, C., Oya, C., & Sender, J. (2008). Lifting the blinkers: A new view of power, diversity and poverty in Mozambican rural labour markets. *The Journal of Modern African Studies*, *46*(03). https://doi.org/10.1017/S0022278X08003340

Cramer, C., Sender, J., & Oqubay, A. (2020). *African economic development: Evidence, theory, policy* (New edition). Oxford University Press.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (Third Edition). SAGE.

Cross, J. C., & Morales, A. (Eds.). (2007). *Street entrepreneurs: People, place and politics in local and global perspective*. Routledge.

Cumbers, A., Helms, G., & Swanson, K. (2010). Class, agency and resistance in the old industrial city. *Antipode*, *42*(1), 46–73. https://doi.org/10.1111/j.1467-8330.2009.00731.x

Curtis, M., & Lissu, T. (2008). *A golden opportunity? How Tanzania is failing to benefit from gold mining* (Second edition). Christian Council of Tanzania (CCT), National Council of Muslims in Tanzania (BAKWATA), Tanzania Espicopal Conference (TEC).

Cust, J., & Poelhekke, S. (2015). *The local economic impacts of natural resource extraction*. Oxford Centre for the Analysis of Resource Rich Economies, University of Oxford. https://ideas.repec.org/p/oxf/oxcrwp/156.html

Cust, J., & Rusli, R. D. (2014). *The economic spillovers from resource extraction: A partial resource blessing at the subnational level?* Nanyang Technological University, School of Social Sciences, Economic Growth Centre. https://ideas.repec.org/p/nan/wpaper/1402.html

Czaja, R., Blair, J., & Blair, E. (2014). *Designing surveys: A guide to decisions and procedures* (Third edition). SAGE.

Daily News. (2012, September 3). *State gazettes new regions, districts*. http://www.dailynews.co.tz/index.php/local-news/2739-state-gazettes-new-regions-districts

Dasgupta, P. (1995). *An inquiry into well-being and destitution* (Reprinted). Clarendon Press.

David, P., & Wright, G. (1997). Increasing returns and the genesis of american resource abundance. *Industrial and Corporate Change*, *6*(2), 203–245. https://doi.org/10.1093/icc/6.2.203

Davis, G. A., & Vásquez Cordano, A. L. (2013). The fate of the poor in growing mineral and energy economies. *Resources Policy*, *38*(2), 138–151. https://doi.org/10.1016/j.resourpol.2012.10.002

Davis, M. (2006). *Planet of slums*. Verso.

de Brier, G., Jorns, A., Geray, M., & Jaillon, A. (2020). *The miner's revenue and basic needs study? Assessement* [sic] *of miner's revenue & basic needs study in the DRC*. IPIS.

de Ferranti, D., Perry, G. E., Lederman, D., & Maloney, W. F. (Eds.). (2002). *From Natural Resources to the Knowledge Economy: Trade and job quality*. World Bank.

De Gregorio, J., & Labbé, F. (2011). *Copper, the real exchange rate and macroeconomic fluctuations in Chile*. Central Bank of Chile. https://EconPapers.repec.org/RePEc:chb:bcchwp:640

de la Torre, C. (2010). *Populist seduction in Latin America* (2nd ed.). Ohio University Press. http://www.jstor.org/stable/j.ctt1j7x7p2

de Soto, H. (1989). *The other path: The invisible revolution in the Third World* (1st ed). Harper & Row.

de Soto, H. (2000). *The mystery of capital: Why capitalism triumphs in the West and fails everywhere else* (First paperback edition). Basic Books.

Deane, K., & Stevano, S. (2016). Towards a political economy of the use of research assistants: Reflections from fieldwork in Tanzania and Mozambique. *Qualitative Research*, *16*(2), 213–228. https://doi.org/10.1177/1468794115578776

Deaton, A. (2000). *The analysis of household surveys: A microeconometric approach to development policy* (3. printing). Johns Hopkins University Press.

Deaton, A. (2004). Measuring poverty. *Princeton Research Program in Development Studies Working Paper*. https://doi.org/10.2139/ssrn.564001

Deaton, A. (2010). Price indexes, inequality, and the measurement of world poverty. *American Economic Review*, *100*(1), 5–34. https://doi.org/10.1257/aer.100.1.5

Deaton, A. (2018). *The analysis of household surveys: A microeconometric approach to development policy* (Reissue edition with a new preface). World Bank Group.

DELVE. (2020). *A global platform for artisanal and small scale mining data*. https://www.delvedatabase.org/

Demirguc-Kunt, A., Klapper, L., Singer, D., & Van Oudheusden, P. (2015). *The Global Findex Database 2014: Bringing the 2 billion unbanked into the financial system* (Findex Notes #2014-2). World Bank. https://www.worldbank.org/content/dam/Worldbank/Research/GlobalFindex/PDF/N2Unbanked.pdf

Desai, V., & Potter, R. B. (Eds.). (2006). *Doing development research*. SAGE.

Devereux, S., & Hoddinott, J. (1993). Issues in data collection. In S. Devereux & J. Hoddinott (Eds.), *Fieldwork in developing countries* (pp. 25–40). Lynne Rienner.

Di John, J. (2009). *From windfall to curse? Oil and industrialization in Venezuela, 1920 to the Present*. Pennsylvania State University Press.

Di John, J. (2011). Is there really a resource curse? A critical survey of theory and evidence. *Global Governance*, *17*(2), 167–184.

Dominick, A. (2021, October 8). Government revokes 175 mining licences. *The Citizen*. https://www.thecitizen.co.tz/tanzania/news/-government-revokes-175-mining-licences-3577176

Downward, P., & Mearman, A. (2006). Retroduction as mixed-methods triangulation in economic research: Reorienting economics into social science. *Cambridge Journal of Economics*, *31*(1), 77–99. https://doi.org/10.1093/cje/bel009

Dreschler, B. (2001). *Small-scale mining and sustainable development within the SADC region.* International Institute of Environment and Development/World Business Council for Sustainable Development.

Eastman, C. M. (1994). Service, slavery (‘Utumwa’) and Swahili social Reality. *Afrikanische Arbeitspapiere*, *37*, 87–107.

Economist, I. U. (2017, July 18). *Mining sector in crisis*. http://country.eiu.com/article.aspx?articleid=1845689568&Country=Tanzania&topic=Economy

Edwards, S. (2012). Is Tanzania a success story? A long term analysis. *National Bureau of Economic Research*, 64.

Elbra, A. (2017). *Governing African gold mining*. Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-56354-5

Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development Studies*, *35*(1), 1–38. https://doi.org/10.1080/00220389808422553

Emel, J., & Huber, M. T. (2008). A risky business: Mining, rent and the neoliberalization of risk. *Geoforum*, *39*(3), 1393–1407. https://doi.org/10.1016/j.geoforum.2008.01.010

Emel, J., Huber, M. T., & Makene, M. H. (2011). Extracting sovereignty: Capital, territory, and gold mining in Tanzania. *Political Geography*, *30*(2), 70–79. https://doi.org/10.1016/j.polgeo.2010.12.007

Engels, B. (2021). Extractivism, informal work and strategies for political-economic transformation. *Review of African Political Economy*, *48*(168), 153–160. https://doi.org/10.1080/03056244.2021.1936975

Engels, B., & Dietz, K. (Eds.). (2017). Contested extractivism, society and the state: An introduction. In *Contested extractivism, society and the state: Struggles over mining and land* (pp. 1–19). Palgrave Macmillan UK.

Erlebach, R. W. (2006). *The importance of wage labour in the struggle to escape poverty: Evidence from Rwanda* [Unpublished doctoral dissertation]. SOAS, University of London.

Evans, A. (1991). Gender issues in rural household economics. *IDS Bulletin*, *22*(1), 51–59. https://doi.org/10.1111/j.1759-5436.1991.mp22001008.x

Ferguson, J. (2005). Seeing like an oil company: Space, security, and global capital in neoliberal Africa. *American Anthropologist*, *107*(3), 377–382. https://doi.org/10.1525/aa.2005.107.3.377

Fields, G. S. (2007). *Labour market* (Working Paper 20). Cornell University. http://digitalcommons.ilr.cornell.edu/workingpapers/20/

Filmer, D., & Pritchett, L. H. (2001). Estimating wealth effects without expenditure data–or tears: An application to educational enrollments [sic] in states of India. *Demography*, *38*(1), 115–132. https://doi.org/10.2307/3088292

Fine, B. (1998). *Labour market theory: A constructive reassessment* (1. issued in paperback). Routledge.

Fine, B. (1999). The developmental state is dead-long live social capital? *Development and Change*, *30*(1), 1–19. https://doi.org/10.1111/1467-7660.00105

Fine, B. (2002). Economics imperialism and the new development economics as Kuhnian paradigm shift? *World Development*, *30*(12), 2057–2070. https://doi.org/10.1016/S0305-750X(02)00122-5

Fine, B. (2007). Rethinking critical realism: Labour markets or capitalism? *Capital & Class*, *31*(1), 125–129. https://doi.org/10.1177/030981680709100106

Fine, B. (2016). *Microeconomics: A critical companion*. Pluto Press.

Fine, B., & Milonakis, D. (2009). *From economics imperialism to freakonomics: The shifting boundaries between economics and other social sciences*. Routledge.

Fischer, A. M. (2018). *Poverty as ideology: Rescuing social justice from global development agendas*. Zed Books.

Fischhoff, B. (2003). Hindsight!= foresight: The effect of outcome knowledge on judgment under uncertainty. *Quality and Safety in Health Care*, *12*(4), 304–311. https://doi.org/10.1136f/qhc.12.4.304

Fisher, E. (2007). Occupying the margins: Labour integration and social exclusion in artisanal mining in Tanzania. *Development and Change*, *38*(4), 735–760. https://doi.org/10.1111/j.1467-7660.2007.00431.x

Fisher, E. (2008). Artisanal gold mining at the margins of mineral resource governance: A case from Tanzania. *Development Southern Africa*, *25*(2), 199–213. https://doi.org/10.1080/03768350802090592

Fisher, E., Mwaipopo, R., Mutagwaba, W., Nyange, D., & Yaron, G. (2009). The ladder that sends us to wealth: Artisanal mining and poverty reduction in Tanzania. *Resources Policy*, *34*(1–2), 32–38. https://doi.org/10.1016/j.resourpol.2008.05.003

Fleetwood, S. (2006). Rethinking labour markets: A critical-realist-socioeconomic perspective. *Capital & Class*, *30*(2), 59–89. https://doi.org/10.1177/030981680608900103

Flyvbjerg, B. (2011). Case study. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (4th ed, pp. 301–316). Sage.

Folbre, N. (1986). Hearts and spades: Paradigms of household economics. *World Development*, *14*(2), 245–255. https://doi.org/10.1016/0305-750X(86)90056-2

Forstater, M., & Readhead, A. (2017, June 23). *Inflated expectations about mineral export: Misinvoicing are having real consequences in Tanzania*. https://www.cgdev.org/blog/inflated-expectations-about-mineral-export-misinvoicing-are-having-real-consequences-tanzania

Förster, M. F. (1994). *Measurement of low incomes and poverty in a perspective of international comparisons* (OECD Labour Market and Social Policy Occasional Paper No. 14). OECD. http://www.oecd.org/social/soc/1895548.pdf

Fourcade, M., Ollion, E., & Algan, Y. (2015). The superiority of economists. *Journal of Economic Perspectives*, *29*(1), 89–114. https://doi.org/10.1257/jep.29.1.89

Fowler, F. J. (2014). *Survey research methods* (Fifth edition). SAGE.

Frankel, J. (2010). *The natural resource curse: A survey* (No. w15836). National Bureau of Economic Research. https://doi.org/10.3386/w15836

Frankel, S. H. (1938). *Capital investment in Africa*. Oxford University Press.

Franz, T. (2020). Latin America: Covid-19 exposes structural problems of commodity-producing economies. *SOAS Blog*. https://study.soas.ac.uk/how-

covid-19-exposed-the-structural-problems-of-commodity-producing-economies-in-latin-america/

Freudenburg, W. R., & Wilson, L. J. (2002). Mining the data: analyzing the economic implications of mining for nonmetropolitan regions. *Sociological Inquiry*, *72*(4), 549–575. https://doi.org/10.1111/1475-682X.00034

Gage, N. (1989). The paradigm wars and their aftermath: A historical sketch of research on teaching since 1989. *Educational Researcher*, *18*(7), 4–10. https://doi.org/10.3102/0013189X018007004

Gamu, J., Le Billon, P., & Spiegel, S. (2015). Extractive industries and poverty: A review of recent findings and linkage mechanisms. *The Extractive Industries and Society*, *2*(1), 162–176. https://doi.org/10.1016/j.exis.2014.11.001

Ge, J., & Lei, Y. (2013). Mining development, income growth and poverty alleviation: A multiplier decomposition technique applied to China. *Resources Policy*, *38*(3), 278–287. https://doi.org/10.1016/j.resourpol.2013.05.004

Geenen, S., & Radley, B. (2014). In the face of reform: What future for ASM in the eastern DRC? *Futures*, *62*(Part A), 58–66. https://doi.org/10.1016/j.futures.2013.10.023

Geenen, S., Stoop, N., & Verpoorten, M. (2021). How much do artisanal miners earn? An inquiry among Congolese gold miners. *Resources Policy*, *70*©, 101893. https://doi.org/10.1016/j.resourpol.2020.101893

Geenen, S., & Verbrugge, B. (2020). Informalization. In *Global gold production touching ground: Expansion, informalization, and technological innovation* (pp. 69–96). Springer International Publishing. https://doi.org/10.1007/978-3-030-38486-9

Gelb, A. H., & associates. (1988). *Oil windfalls: Blessing or curse?* Published for The World Bank [by] Oxford University Press.

George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences*. MIT Press.

Gerald, C. (2019, January 23). *Magufuli orders review of mining sector taxes*. Ippmedia. https://www.ippmedia.com/en/news/magufuli-orders-review-mining-sector-taxes

Gerig, L., Ndagano, P., Schneck, N., & Hoex, L. (2020). *Delve country profile: Tanzania*. https://delvedatabase.org/resources/delve-country-profile-tanzania

Gidron, N., & Bonikowski, B. (2013). *Varieties of populism: Literature review and research agenda* (No. 13–0004; Weatherhead Working Paper Series). Weatherhead Center for International Affairs.

Gilberthorpe, E. (2014). Community development in Ok Tedi, Papua New Guinea: The role of anthropology in the extractive industries. *Community Development Journal*, *48*(3), 466–483. https://doi.org/10.1093/cdj/bst028

Gilberthorpe, E., & Rajak, D. (2017). The anthropology of extraction: Critical perspectives on the resource curse. *The Journal of Development Studies*, *53*(2), 186–204. https://doi.org/10.1080/00220388.2016.1160064

Ginsburg, N. (1957). Natural resources and economic development. *Annals of the Association of American Geographers*, *47*(3), 197–212. JSTOR.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, *16*(1), 15–31. https://doi.org/10.1177/1094428112452151

Githaiga, H. (2017, October 19). *Tanzania to own 16pc stake in Acacia's three gold mines*. The East African. https://www.theeastafrican.co.ke/tea/business/tanzania-to-own-16pc-stake-in-acacia-s-three-gold-mines-1375724

Gittelsohn, J., & Mookherji, S. (1997). The Application of anthropological methods to the study of intrahousehold resource allocation. In L. J. Haddad, J. Hoddinott, & H. Alderman (Eds.), *Intrahousehold resource allocation in developing countries: Models, methods, and policy* (pp. 165–178). Johns Hopkins University Press.

Golub, A. (2007). Ironies of Organization: Landowners, land registration, and Papua New Guinea's mining and petroleum industry. *Human Organization*, *66*(1), 38–48. https://doi.org/10.17730/humo.66.1.157563342241q348

Golub, S., & Hayat, F. (2014). *Employment, unemployment, and underemployment in Africa* (14th ed., Vol. 2014). UNU-WIDER. https://doi.org/10.35188/UNU-WIDER/2014/735-6

Graaff, K., & Ha, N. (Eds.). (2015). *Street Vending in the neoliberal city: A global perspective on the practices and policies of a marginalized economy*. Berghahn Books.

Gray, H. S. (2012). *Tanzania and Vietnam: A comparative political economy of economic transition* [Doctoral dissertation]. SOAS, University of London.

Gray, H. S. (2015). The political economy of grand corruption in Tanzania. *African Affairs*, *114*(456), 382–403. https://doi.org/10.1093/afraf/adv017

Greco, E. (2020). Africa, extractivism and the crisis this time. *Review of African Political Economy*, *47*(166), 511–521. https://doi.org/10.1080/03056244.2020.1859839

Grosh, M., & Glewwe, P. (2000). *Designing household survey questionnaires for developing countries: Lessons from 15 years of the Living Standards Measurement Study, Volume 3* (No. 20731). World Bank. https://openknowledge.worldbank.org/handle/10986/15195

Gründer, H. (2018). *Geschichte der deutschen Kolonien* (Issue 1332). UTB.

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Sage Publications.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In *Handbook of qualitative research.* (pp. 105–117). Sage Publications, Inc.

Gylfason, T. (2001). Natural resources, education, and economic development. *European Economic Review*, *45*(4–6), 847–859. https://doi.org/10.1016/S0014-2921(01)00127-1

Gylfason, T. (2011). *Natural resource endowment: A mixed blessing?* CESifo Group Munich. https://ideas.repec.org/p/ces/ceswps/_3353.html

Haddad, L. J., Hoddinott, J., & Alderman, H. (1997). Introduction: The scope of intrahousehold resource allocation issues. In L. J. Haddad, J. Hoddinott, & H. Alderman (Eds.), *Intrahousehold resource allocation in developing countries: Models, methods, and policy* (pp. 1–16). Johns Hopkins University Press.

Hadley, C., Belachew, T., Lindstrom, D., & Tessema, F. (2011). The shape of things to come? Household dependency ratio and adolescent nutritional status in rural

and urban Ethiopia. *American Journal of Physical Anthropology*, *144*(4), 643–652. https://doi.org/10.1002/ajpa.21463

Halliday, T. J. (2010). Mismeasured household size and its implications for the identification of economies of scale. *Oxford Bulletin of Economics and Statistics*, *72*(2), 246–262. https://doi.org/10.1111/j.1468-0084.2009.00570.x

Hanmer, L. C., Pyatt, G., & White, H. (1999). What do the World Bank's poverty assessments teach us about poverty in sub-Saharan Africa? *Development and Change*, *30*(4), 795–823. https://doi.org/10.1111/1467-7660.00138

Hansen, K. T. (Ed.). (2013). *Street economies in the urban global south* (First edition). SAR Press, School for Advanced Research Press.

Hansen, K. T., & Vaa, M. (Eds.). (2004). *Reconsidering informality: Perspectives from urban Africa*. Nordiska Afrikainstitutet.

Hansen, M. W., Buur, L., Mette Kjær, A., & Therkildsen, O. (2016). The economics and politics of local content in African extractives: Lessons from Tanzania, Uganda and Mozambique. *Forum for Development Studies*, *43*(2), 201–228. https://doi.org/10.1080/08039410.2015.1089319

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Forum Qualitative Sozialforschung/ Forum Qualitative Social Research*, *Vol 18*, No 1 (2017)-. https://doi.org/10.17169/fqs-18.1.2655

Hart, K. (1973). Informal income opportunities and urban employment in Ghana. *The Journal of Modern African Studies*, *11*(01), 61–89. https://doi.org/10.1017/S0022278X00008089

Harttgen, K., Klasen, S., & Vollmer, S. (2013). An African growth miracle? Or: What do asset indices tell us about trends in economic performance? *Review of Income and Wealth*, *59*, 37–61. https://doi.org/10.1111/roiw.12016

Haughton, J., & Khandker, S. R. (2009). *Handbook on poverty and inequality (English)* (No. 48338). World Bank Group.

Havnevik, K., Bryceson, D. F., Birgegard, L.-E., Matondi, P., & Beyene, A. (Eds.). (2007). *African agriculture and the World Bank: Development or impoverishment?* Nordiska Afrikainstitutet.

Heemskerk, M. (2003). Self-employment and poverty alleviation: Women's work in artisanal gold mines. *Human Organization*, *62*(1), 62–73. https://doi.org/10.17730/humo.62.1.5pv74nj41xldexd8

Helwege, A., & Birch, M. (2007). *Declining poverty in Latin America? A critical analysis of new estimates by international institutions* [Working Paper]. Tufts University.

Herb, M. (2005). No representation without taxation? Rents, development, and democracy. *Comparative Politics*, *37*(3), 297–316. https://doi.org/10.2307/20072891

Hilson, G. (2002a). Small-scale mining and its socio-economic impact in developing countries. *Natural Resources Forum*, *26*(1), 3–13. https://doi.org/10.1111/1477-8947.00002

Hilson, G. (2002b). Harvesting mineral riches: 1000 years of gold mining in Ghana. *Resources Policy*, *28*(1–2), 13–26. https://doi.org/10.1016/S0301-4207(03)00002-3

Hilson, G. (2006). Championing the rhetoric? *Greener Management International*, *2006*(53), 42–56. https://doi.org/10.9774/GLEAF.3062.2006.sp.00005

Hilson, G. (2009). Small-scale mining, poverty and economic development in sub-Saharan Africa: An overview. *Resources Policy*, *34*(1–2), 1–5. https://doi.org/10.1016/j.resourpol.2008.12.001

Hilson, G. (2010). Once a miner, always a miner: Poverty and livelihood diversification in Akwatia, Ghana. *Journal of Rural Studies*, *26*(3), 296–307. https://doi.org/10.1016/j.jrurstud.2010.01.002

Hilson, G. (2011). Artisanal mining, smallholder farming ad livelihood diversification in rural sub-Saharan Africa: An introduction. *Journal of International Development*, *23*(8), 1031–1041. https://doi.org/10.1002/jid.1829

Hilson, G. (2012). Poverty traps in small-scale mining communities: The case of sub-Saharan Africa. *Canadian Journal of Development Studies/Revue Canadienne d'études Du Développement*, *33*(2), 180–197. https://doi.org/10.1080/02255189.2012.687352

Hilson, G. (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, G., Amankwah, R., & Ofori-Sarpong, G. (2013). Going for gold: Transitional livelihoods in Northern Ghana. *The Journal of Modern African Studies*, *51*(01), 109–137. https://doi.org/10.1017/S0022278X12000560

Hilson, G., & Garforth, C. (2012). Agricultural poverty and the expansion of artisanal mining in sub-Saharan Africa: Experiences from Southwest Mali and Southeast Ghana. *Population Research and Policy Review*, *31*(3), 435–464. https://doi.org/10.1007/s11113-012-9229-6

Hilson, G., & Laing, T. (2017). Guyana gold: A unique resource curse? *The Journal of Development Studies*, *53*(2), 229–248. https://doi.org/10.1080/00220388.2016.1160066

Hilson, G., & McQuilken, J. (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

Hilson, G., & Pardie, S. (2006). Mercury: An agent of poverty in Ghana's small-scale gold-mining sector? *Resources Policy*, *31*(2), 106–116. https://doi.org/10.1016/j.resourpol.2006.09.001

Hilson, G., & Potter, C. (2005). Structural adjustment and subsistence industry: Artisanal gold mining in Ghana. *Development and Change*, *36*(1), 103–131. https://doi.org/10.1111/j.0012-155X.2005.00404.x

Hinojosa, L. (2011). Riqueza mineral y pobreza en los Andes. *The European Journal of Development Research*, *23*(3), 488–504. https://doi.org/10.1057/ejdr.2011.11

Hirschman, A. O. (1958). *The Strategy of Economic Development* (Vol. 41). Yale University Press. https://academic.oup.com/ajae/article-lookup/doi/10.2307/1235188

Hockin, V. T. (1952). Brief history of mining in Tanganyika. *Rhodes House Library, Oxford*.

Holland, J., & Campbell, J. (Eds.). (2005). *Methods in development research: Combining qualitative and quantitative approaches*. ITDG.

Howe, L. D., Galobardes, B., Matijasevich, A., Gordon, D., Johnston, D., Onwujekwe, O., Patel, R., Webb, E. A., Lawlor, D. A., & Hargreaves, J. R. (2012). Measuring socio-economic position for epidemiological studies in low- and middle-income countries: A methods of measurement in epidemiology paper. *International Journal of Epidemiology*, *41*(3), 871–886. https://doi.org/10.1093/ije/dys037

Howe, L. D., Hargreaves, J. R., & Huttly, S. R. (2008). Issues in the construction of wealth indices for the measurement of socio-economic position in low-income countries. *Emerging Themes in Epidemiology*, *5*(3). https://doi.org/10.1186/1742-7622-5-3

HRW. (2013). *Toxic toil: Child labor and mercury exposure in Tanzania's small-scale gold mines*. Human Rights Watch.

HRW. (2017). *I had a dream to finish school: Barriers to secondary education in Tanzania*. Human Rights Watch.

HRW. (2019). *'As long as I am quiet, I am safe': Threats to independent media and civil society in Tanzania*. Human Rights Watch. https://www.hrw.org/sites/default/files/report_pdf/tanzania1019_web_2.pdf

Hume, D. (1777). *Essays: Moral, political, and literary* (Rev. ed). Liberty Fund.

Hussain, A. (2003). *Urban poverty in China. Measurement, patterns and policies. In Focus Programme on Socio-Economic Security.* International Labour Organization. https://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=4954283

Hyman, L., Lamb, J., & Bulmer, M. (2006). The use of pre-existing survey questions: Implications for data quality. *Proceedings of the European Conference on Quality in Survey Statistics*, 1–8.

IBRD. (1961). *The economic development of Tanganyika*. International Bank for Reconstruction and Development.

Idemudia, U. (2009). Oil extraction and poverty reduction in the Niger Delta: A critical examination of partnership initiatives. *Journal of Business Ethics*, *90*(S1), 91–116. https://doi.org/10.1007/s10551-008-9916-8

Idemudia, U. (2012). The resource curse and the decentralization of oil revenue: The case of Nigeria. *Journal of Cleaner Production*, *35*, 183–193. https://doi.org/10.1016/j.jclepro.2012.05.046

IGF. (2017). *Global trends in artisanal and small-scale mining (ASM): A review of key numbers and issues.* Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, IISD.

Iliffe, J. (1969). *Tanganyika under German rule, 1905-1921*. Cambridge: Cambridge University Press.

Iliffe, J. (1979). *A modern history of Tanganyika*. Cambridge: Cambridge University Press.

ILO. (1972). *Employment, incomes and equality: A strategy for increasing productive employment in Kenya*. International Labour Office.

ILO. (1999). *Social and labour issues in small-scale mines: Report for discussion at the Tripartite Meeting on social and labour issues in small-scale mines* [TMSSM].

Ippmedia. (2016a, November 21). *Magufuli sacks TRA board of directors in major shake-up*. http://www.ippmedia.com/en/news/magufuli-sacks-tra-board-directors-major-shake

Ippmedia. (2016b, December 7). *Magufuli orders removal of top mining from gold field*. https://www.ippmedia.com/en/news/magufuli-orders-removal-top-mining-gold-field

Ippmedia. (2017, May 28). *The cost of JPM's economic warfare*. https://www.ippmedia.com/en/news/cost-jpm%E2%80%99s-economic-warfare

Ironmonger, D. (1996). Counting outputs, capital inputs and caring labor: Estimating gross household product. *Feminist Economics*, *2*(3), 37–64. https://doi.org/10.1080/13545709610001707756

Isham, J., Pritchett, L., & Woolcock, M. (2004). The social foundations of poor economic growth in resource-rich countries. In R. M. Auty (Ed.), *Resource Abundance and Economic Development* (pp. 76–93). Oxford University Press. https://doi.org/10.1093/0199275785.003.0005

Isham, J., Woolcock, M., Pritchett, L., & Busby, G. (2005). The varieties of resource experience. *World Bank Economic Review*, *19*(2), 141–174. https://doi.org/10.1093/wber/lhi010

Jacob, T., & Pedersen, R. H. (2018). New resource nationalism? Continuity and change in Tanzania's extractive industries. *The Extractive Industries and Society*, *5*(2), 287–292. https://doi.org/10.1016/j.exis.2018.02.001

Jacob, T., Pedersen, R. H., Maganga, F., & Kweka, O. (2016). *Rights to land and extractive resources in Tanzania (2/2): The return of the state*. DIIS, Danish Institute for International Studies. http://hdl.handle.net/10419/148327

James, R. W. (1971). *Land tenure and policy in Tanzania*. University of Toronto Press.

Jaques, E., Zida, B., Billa, M., Greffié, C., & Thomassin, J.-F. (2006). Artisanal and small-scale gold mines in Burkina Faso: Today and tomorrow. In G. Hilson (Ed.), *Small-Scale Mining, Rural Subsistence and Poverty in West Africa*. Practical Action Publishing. https://doi.org/10.3362/9781780445939

Jensen, N., & Wantchekon, L. (2004). Resource wealth and political regimes in Africa. *Comparative Political Studies*, *37*(7), 816–841. https://doi.org/10.1177/0010414004266867

Jerven, M. (2010). The relativity of poverty and income: How reliable are African economic statistics? *African Affairs*, *109*(434), 77–96. https://doi.org/10.1093/afraf/adp064

Jerven, M. (2013). *Poor numbers: How we are misled by African development statistics and what to do about it*. Cornell University Press.

Jerven, M. (2015). *Africa: Why economists get it wrong*. Zed Books.

Jessop, B. (2016). *The state: Past, present, future*. Polity Press.

Johnson, B., & Gray, R. (2010). A history of philosophical and theoretical issues for mixed methods research. In *SAGE handbook of mixed methods in social & behavioral research* (2nd ed., pp. 69–94). SAGE Publications, Inc. https://doi.org/10.4135/9781506335193

Johnston, D. (2015). Disguised employment? Labour market surveys, migration and rural employment in Southern Africa. In C. Oya & N. Pontara (Eds.), *Rural wage employment in developing countries: Theory, evidence and policy* (pp. 128–143). Routledge.

Johnston, D., & Abreu, A. (2016). The asset debates: How (not) to use asset indices to measure well-being and the middle class in Africa. *African Affairs*, *115*(460), 399–418. https://doi.org/10.1093/afraf/adw019

Jones, J. V. S. (1983). *Resources and industry in Tanzania: Use, misuse and abuse*. Tanzania Pub. House.

Jønsson, J. B., & Bryceson, D. F. (2009). Rushing for gold: Mobility and small-scale mining in East Africa. *Development and Change*, *40*(2), 249–279. https://doi.org/10.1111/j.1467-7660.2009.01514.x

Jønsson, J. B., & Bryceson, D. F. (2017). Beyond the artisanal mining site: Migration, housing capital accumulation and indirect urbanization in East Africa. *Journal of Eastern African Studies*, *11*(1), 3–23. https://doi.org/10.1080/17531055.2017.1287245

Jønsson, J. B., Bryceson, D. F., Kinabo, C., & Shand, M. (2019). Getting grounded? Miners' migration, housing and urban settlement in Tanzania, 1980–2012. *The Extractive Industries and Society*, *6*(3), 948–959. https://doi.org/10.1016/j.exis.2019.05.007

Jønsson, J. B., & Fold, N. (2009). Handling uncertainty: Policy and organizational practices in Tanzania's small-scale gold mining sector. *Natural Resources Forum*, *33*(3), 211–220. https://doi.org/10.1111/j.1477-8947.2009.01226.x

Jønsson, J. B., & Fold, N. (2011). Mining from below: Taking Africa's artisanal miners seriously. *Geography Compass*, *5*(7), 479–493. https://doi.org/10.1111/j.1749-8198.2011.00435.x

Kabeer, N. (1997). Women, wages and intra-household power relations in urban Bangladesh. *Development and Change*, *28*(2), 261–302. https://doi.org/10.1111/1467-7660.00043

Kabeer, N. (1998). Jumping to conclusions? Struggles over meaning and method in the study of household economics. In C. Jackson & R. Pearson (Eds.), *Feminist visions of development: Gender analysis and policy* (pp. 93–109). Routledge.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291. https://doi.org/10.1126/science.185.4157.1124

Kaijage, F. J. (1983a). *Labour conditions in the Tanzanian mining industry, 1930-1960* (Working Paper No. 83; p. 24). Boston University, African Studies Center.

Kaijage, F. J. (1983b). *Peasant resistance to proletarianization in colonial Tanzania* (Working Paper No. 81; p. 18). Boston University, African Studies Center.

Kaldor, N. (1967). *Strategic factors in economic development*. New York State School of Industrial and Labor Relations, Cornell University.

Kambani, S. M. (2003). Small-scale mining and cleaner production issues in Zambia. *Journal of Cleaner Production*, *11*(2), 141–146. https://doi.org/10.1016/S0959-6526(02)00033-1

Kamete, A. Y. (2008). When livelihoods take a battering...Mapping the 'New Gold Rush' in Zimbabwe's Angwa-Pote Basin. *Transformation: Critical Perspectives on Southern Africa*, *65*(1), 36–67. https://doi.org/10.1353/trn.2008.0009

Kamlongera, P. J. (2011). Making the poor poorer or alleviating poverty? Artisanal mining livelihoods in rural Malawi. *Journal of International Development*, *23*(8), 1128–1139. https://doi.org/10.1002/jid.1836

Kandiyoti, D. (1998). Gender, power, and contestation: Rethinking bargaining with patriarchy. In C. Jackson & R. Pearson (Eds.), *Feminist visions of development: Gender analysis and policy* (pp. 138–154). Routledge.

Karamba, R. W., Belghith, N. B. H., Talbert, E. A., & De Boisseson, P. M. A. (2019). *Tanzania—Mainland Poverty Assessment 2019: Executive Summary (English)* (Executive Summary No. 144228). World Bank Group.

Karl, T. L. (1997). *The paradox of plenty: Oil booms and petro-states*. University of California Press.

Karl, T. L. (2007). Ensuring fairness: The case for a transparent fiscal social contract. In M. Humphreys, J. Sachs, & J. E. Stiglitz (Eds.), *Escaping the resource curse* (pp. 237–268). Columbia University Press.

Keita, S. (2001). *Study on artisanal and small-scale mining in Mali* (Mining, Minerals and Sustainable Development (MMSD)). International Institute for Environment and Development (IIED).

Kelle, U. (2015). *Mixed methods and the problems of theory building and theory testing in the social sciences* (S. N. Hesse-Biber & R. B. Johnson, Eds.). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199933624.013.36

Keniston, D., & Allcott, H. (2015). *Dutch disease or agglomeration? The local economic effects of natural resource booms in modern America*. Unpublished. https://doi.org/10.13140/RG.2.1.5054.9284

Kinyanjui, M. N. (2014). *Women and the informal economy in urban Africa: From the margins to the centre*. Zed Books.

Kinyondo, A., & Huggins, C. (2019). Resource nationalism in Tanzania: Implications for artisanal and small-scale mining. *The Extractive Industries and Society*, *6*(1), 181–189. https://doi.org/10.1016/j.exis.2018.08.005

Klein, A. (1999). The barracuda's tale: Trawlers, the informal sector and a state of classificatory disorder off the Nigerian coast. *Africa*, *69*(4), 555–574. https://doi.org/10.2307/1160875

Kolenikov, S., & Angeles, G. (2009). Socioeconomic status measurement with discrete proxy variables: Is principal component analysis a reliable answer? *Review of Income and Wealth*, *55*(1), 128–165. https://doi.org/10.1111/j.1475-4991.2008.00309.x

Krugman, P. (1987). The narrow moving band, the Dutch disease, and the competitive consequences of Mrs. Thatcher. *Journal of Development Economics*, *27*(1–2), 41–55. https://doi.org/10.1016/0304-3878(87)90005-8

Kuhn, T. S. (1970). *The Structure of scientific revolutions* (2nd ed., enlarged, Vol. 2). Chicago University Press.

Kulindwa, K., Mashindano, O., Shechambo, F., & Sosovele, H. (2003). *Mining for sustainable development in Tanzania*. Dar es Salaam University Press.

Kvangraven, I. H. (2020). Nobel rebels in disguise—Assessing the rise and rule of the randomistas. *Review of Political Economy*, *32*(3), 305–341. https://doi.org/10.1080/09538259.2020.1810886

Laderchi, C. R., Saith, R., & Stewart, F. (2003). Does it matter that we do not agree on the definition of poverty? A Comparison of four approaches. *Oxford Development Studies*, *31*(3), 243–274. https://doi.org/10.1080/1360081032000111698

Lagos, G., & Blanco, E. (2010). Mining and development in the region of Antofagasta. *Resources Policy*, *35*(4), 265–275. https://doi.org/10.1016/j.resourpol.2010.07.006

Lahiri-Dutt, K. (2018). Extractive peasants: Reframing informal artisanal and small-scale mining debates. *Third World Quarterly*, *39*(8), 1561–1582. https://doi.org/10.1080/01436597.2018.1458300

Lakner, C., Yonzan, N., Mahler, D. G., Castaneda Aguilar, R. A., Wu, H., & Fleury, M. (2020, October 7). Updated estimates of the impact of COVID-19 on global poverty: The effect of new data. *World Bank Blogs*. https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-effect-new-data

Lam, R., & Wantchekon, L. (1999). *Dictatorships as a political Dutch disease* (Working Papers No. 795). Economic Growth Center, Yale University.

Lange, S. (2006). *Benefit streams from mining in Tanzania: Case studies from Geita and Mererani*. Christian Michelsen Institute.

Lange, S. (2011). Gold and governance: Legal injustices and lost opportunities in Tanzania. *African Affairs*, *110*(439), 233–252. https://doi.org/10.1093/afraf/adr003

Lange, S., & Kinyondo, A. (2016). Resource nationalism and local content in Tanzania: Experiences from mining and consequences for the petroleum sector. *The Extractive Industries and Society*, *3*(4), 1095–1104. https://doi.org/10.1016/j.exis.2016.09.006

Lavrakas, P. J. (Ed.). (2008). *Encyclopedia of survey research methods*. SAGE Publications.

Lawson, T. (1997). *Economics and reality*. Routledge.

Lawson, T. (2006). The nature of heterodox economics. *Cambridge Journal of Economics*, *30*(4), 483–505. https://doi.org/10.1093/cje/bei093

Lee, F. S., & Cronin, B. (Eds.). (2016). *Handbook of research methods and applications in heterodox economics*. Edward Elgar Publishing.

Leite, C., & Weidmann, J. (1999). *Does mother nature corrupt—Natural resources, corruption, and economic growth*. International Monetary Fund.

Lemelle, S. J. (1986). *Capital, state and labor: A history of the gold mining industry in colonial Tanganyika 1890-1942* [Doctoral dissertation]. University of California at Los Angeles.

Leontaridi, M. (1998). Segmented labour markets: Theory and evidence. *Journal of Economic Surveys*, *12*(1), 103–109. https://doi.org/10.1111/1467-6419.00048

Lerche, J. (2010). From rural labour to classes of labour: Class fragmentation, caste and class struggle at the bottom of the Indian labour hierarchy. In B. Harriss-White & J. Heyer (Eds.), *The comparative political economy of development: Africa and South Asia* (pp. 66–87). Routledge.

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, *22*(2), 139–191. https://doi.org/10.1111/j.1467-9957.1954.tb00021.x

Lindell, I. (Ed.). (2010). *Africa's informal workers: Collective agency, alliances and transnational organizing in urban Africa*. Nordiska Afrikainstitutet and Zed Books.

Lissu, T. (2001). In gold we trust: The political economy of law, human rights and environment in Tanzania's mining industry, Work in Progress. *Law, Social Justice & Global Development Journal*, *2*. https://warwick.ac.uk/fac/soc/law/elj/lgd/2001_2/lissu1

Liu, Y. (2014). Is the natural resource production a blessing or curse for China's urbanization? Evidence from a space–time panel data model. *Economic Modelling*, *38*, 404–416. https://doi.org/10.1016/j.econmod.2014.01.023

Lloyd, C. (1986). *Explanation in social history*. B. Blackwell.

Loayza, N. V., Mier y Teran, A., & Rigolini, J. (2013). *Poverty, inequality, and the local natural resource curse*. The World Bank. https://doi.org/10.1596/1813-9450-6366

Loayza, N. V., & Raddatz, C. (2010). The composition of growth matters for poverty alleviation. *Journal of Development Economics*, *93*(1), 137–151. https://doi.org/10.1016/j.jdeveco.2009.03.008

Luong, P. J., & Weinthal, E. (2006). Rethinking the resource curse: Ownership structure, institutional capacity, and domestic constraints. *Annual Review of Political Science*, *9*(1), 241–263. https://doi.org/10.1146/annurev.polisci.9.062404.170436

Mackintosh, M. (1989). *Gender, class, and rural transition: Agribusiness and the food crisis in Senegal*. Zed Books.

Maconachie, R., & Binns, T. (2007). Farming miners or mining farmers?: Diamond mining and rural development in post-conflict Sierra Leone. *Journal of Rural Studies*, *23*(3), 367–380. https://doi.org/10.1016/j.jrurstud.2007.01.003

Madrid, R. L. (2008). The rise of ethnopopulism in Latin America. *World Politics*, *60*(3), 475–508. https://doi.org/10.1017/S0043887100009060

Mahdavy, H. (1970). The Patterns and problems of economic development in a rentier state: The case of Iran. In *Studies in economic history of the Middle East*. Oxford University Press.

Malanga, A. N. (2021, February 24). *Six key challenges that impede Tanzania's mining sector*. The Citizen. https://www.thecitizen.co.tz/tanzania/news/six-key-challenges-that-impede-tanzania-s-mining-sector-3302948

Malefakis, A. (2019). *Tanzania's informal economy: The micro-politics of street vending*. ZED Books.

Mallya, R. (2018, August 19). JPM akwea Dreamliner na abiria kwenda Mwanza. *Habari Leo*. https://www.ippmedia.com/sw/habari/jpm-akwea-dreamliner-na-abiria-kwenda-mwanza

Manzano, O., & Rigobon, R. (2001). *Resource curse or debt overhang?* (No. w8390). National Bureau of Economic Research. https://doi.org/10.3386/w8390

Maponga, O., & Ngorima, C. F. (2003). Overcoming environmental problems in the gold panning sector through legislation and education: The Zimbabwean experience. *Journal of Cleaner Production*, *11*(2), 147–157. https://doi.org/10.1016/S0959-6526(02)00034-3

Martin, R. L. (2000). Local labour markets: Their nature, performance, and regulation. In G. L. Clark, M. P. Feldman, & M. S. Gertler (Eds.), *The Oxford handbook of economic geography* (pp. 455–477). Oxford University Press.

Materu, B. (2018, August 3). *Tanzania withholds Twaweza director's passport*. The East African. https://www.theeastafrican.co.ke/tea/news/east-africa/tanzania-withholds-twaweza-director-s-passport-1399664

Matsuyama, K. (1992). Agricultural productivity, comparative advantage, and economic growth. *Journal of Economic Theory*, *58*(2), 317–334. https://doi.org/10.1016/0022-0531(92)90057-O

Mattila-Wiro, P. (1999). *Economic theories of the household: A critical review*. UNU World Institute for Development Economics Research.

Maxwell, J. A., & Mittapalli, K. (2010). Realism as a stance for mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Sage handbook of mixed methods in social & behavioral research* (2nd ed, pp. 145–167). SAGE Publications.

McHenry, D. E. (1994). *Limited choices: The political struggle for socialism in Tanzania*. Lynne Rienner.

McKenzie, D. J. (2005). Measuring inequality with asset indicators. *Journal of Population Economics*, *18*(2), 229–260. https://doi.org/10.1007/s00148-005-0224-7

Meagher, K. (1995). Crisis, informalization and the urban informal sector in sub-Saharan Africa. *Development and Change*, *26*(2), 259–284. https://doi.org/10.1111/j.1467-7660.1995.tb00552.x

Meagher, K. (2010). *Identity economics: Social networks and the informal economy in Nigeria*. James Currey and HEBN Publishers.

Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal*, *116*(508), 1–20. https://doi.org/10.1111/j.1468-0297.2006.01045.x

Merket, H. (2019). *Mapping artisanal and small-scale mining in northwest Tanzania: A survey on its nature, scope and impact* (p. 72). International Peace Information Service (IPIS).

Mezzadri, A., & Fan, L. (2018). Classes of labour at the margins of global commodity chains in India and China. *Development and Change*, *49*(4), 1034–1063. https://doi.org/10.1111/dech.12412

Michaels, G. (2011). The long term consequences of resource-based specialisation. *The Economic Journal*, *121*(551), 31–57. https://doi.org/10.1111/j.1468-0297.2010.02402.x

Michelson, H., Muñiz, M., & DeRosa, K. (2013). Measuring socio-economic status in the millennium villages: The role of asset index choice. *Journal of Development Studies*, *49*(7), 917–935. https://doi.org/10.1080/00220388.2013.785525

Mikesell, R. F. (1997). Explaining the resource curse, with special reference to mineral-exporting countries. *Resources Policy*, *23*(4), 191–199. https://doi.org/10.1016/S0301-4207(97)00036-6

Milonakis, D., & Fine, B. (2007). Douglass North's remaking of economic history: A critical appraisal. *Review of Radical Political Economics*, *39*(1), 27–57. https://doi.org/10.1177/0486613406296896

Milonakis, D., & Fine, B. (2009). *From political economy to economics: Method, the social and the historical in the evolution of economic theory*. Routledge.

Ministry of Minerals and Energy. (2012). *ASM Baseline Survey*. Ministry of Minerals and Energy.

Minute, Green to Bottomley. (1927). C.O. 691/150/42110/5.

Mitullah, W. V., Ogola, J. S., & Omulo, M. A. (2003). The socio-economic aspects of artisanal gold mining in Migori District, Kenya. In G. Hilson (Ed.), *The socio-economic impacts of artisanal and small-scale mining in developing countries* (pp. 260–270). A.A. Balkema.

Mondlane, S., & Shoko, D. S. M. (2003). The socio-economic and environmental impacts of artisanal and small-scale mining in Mozambique. In G. Hilson (Ed.), *The socio-economic impacts of artisanal and small-scale mining in developing countries: Vol. 1st ed.* (pp. 244–269). CRC Press.

Morduch, J. (1995). Income smoothing and consumption smoothing. *The Journal of Economic Perspectives*, *9*(3), 103–114. https://doi.org/10.1257/jep.9.3.103

Moser, C. O. N. (1978). Informal sector or petty commodity production: Dualism or dependence in urban development? *World Development*, *6*(9–10), 1041–1064. https://doi.org/10.1016/0305-750X(78)90062-1

Mueller, B. (2011). The agrarian question in Tanzania: Using new evidence to reconcile an old debate. *Review of African Political Economy*, *38*(127), 23–42. https://doi.org/10.1080/03056244.2011.552589

Mueller, B. (2012). *The poverty of the smallholder ideal: Highlighting Tanzania's rural labour market* (Number 71; Development Viewpoint). Centre for Development Policy and Research. https://eprints.soas.ac.uk/13197/1/mueller_(2012)_poverty_of_the_smallholder_ideal.pdf

Mueller, B. (2015). Tanzania's rural labour markets—The missing link between development and poverty reduction. In C. Oya & N. Pontara (Eds.), *Rural wage employment in developing countries: Theory, evidence and policy* (pp. 144–170). Routledge.

Mueller, B. & Man-Kwun Chan. (2015). *Wage labor, agriculture-based economies, and pathways out of poverty* (Leveraging Economic Opportunities (LEO) No. 15). US Aid. http://rgdoi.net/10.13140/RG.2.2.20049.17760

Murphy, K. M., Shleifer, A., & Vishny, R. W. (1989). Industrialization and the big push. *Journal of Political Economy*, *97*(5), 1003–1026. https://doi.org/10.1086/261641

Mutagwaba, W., Bosco Tindyebwa, J., Makanta, V., Kaballega, D., & Maeda, G. (2018). *Artisanal and small-scale mining in Tanzania – Evidence to inform an 'action dialogue'* [Research Report]. IIED.

Mwaipopo, R., Mutagwaba, W., Nyange, D., & Fisher, E. (2004). *Increasing the contribution of artisanal and small-scale mining to poverty reduction in Tanzania*. London: Department for International Development. https://assets.publishing.service.gov.uk/media/57a08cd4e5274a31e0001492/C393.pdf

Mwitwa, J., German, L., Muimba-Kankolongo, A., & Puntodewo, A. (2012). Governance and sustainability challenges in landscapes shaped by mining: Mining-forestry linkages and impacts in the copper belt of Zambia and the DR Congo. *Forest Policy and Economics*, *25*, 19–30. https://doi.org/10.1016/j.forpol.2012.08.001

Namkwahe, J. (2017, 28). President Magufuli sacks 9,932 civil servants at a go. *The Citizen*. https://www.thecitizen.co.tzhttps://www.thecitizen.co.tz/tanzania/news/president-magufuli-sacks-9-932-civil-servants-at-a-go-2587390

NBS. (2014). *Tanzania Household Budget Survey 2011/2012*.

NBS. (2019). *Tanzania Mainland Household Budget Survey 2017-18 ,Key Indicators Report*. Ministry of Finance and Planning-Poverty Eradication Division (MoFP-PED [Tanzania Mainland] and National Bureau of Statistics (NBS).

Neary, J. P., & van Wijnbergen, S. (1985). *Natural resources and the macroeconomy: A theoretical framework*. School of Economics, University College Dublin. https://EconPapers.repec.org/RePEc:ucn:wpaper:198536

Nel, E., Binns, T., & Gibb, M. (2014). Community development at the coal face: Networks and sustainability among artisanal mining communities in Indwe, Eastern Cape Province, South Africa. *The Geographical Journal*, *180*(2), 175–184. https://doi.org/10.1111/geoj.12022

Nkwame, M. (2018, March 8). Government suspends small-scale mining subsidies. *Daily News*. https://dailynews.co.tz/news/2018-08-035b64053dafda7.aspx

Noetstaller, R. (1987). *Small-scale mining: A review of the issues*. World Bank.

Nyankweli, E. M. (2012). *Foreign direct investment and poverty alleviation: The case of Bulyanhulu and Geita gold mines, Tanzania*. African Studies Centre.

Obiri, S., Mattah, P., Mattah, M., Armah, F., Osae, S., Adu-kumi, S., & Yeboah, P. (2016). Assessing the environmental and socio-economic impacts of artisanal gold mining on the livelihoods of communities in the Tarkwa Nsuaem Municipality in Ghana. *International Journal of Environmental Research and Public Health*, *13*(2), 160. https://doi.org/10.3390/ijerph13020160

OECD. (n.a.). *What are equivalence scales?* [OECD Project on Income Distribution and Poverty]. http://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf

Okoh, G., & Hilson, G. (2011). Poverty and livelihood diversification: Exploring the linkages between smallholder farming and artisanal mining in rural Ghana. *Journal of International Development*, *23*(8), 1100–1114. https://doi.org/10.1002/jid.1834

Oya, C. (2010). *Rural labour markets in Africa: The unreported source of inequality and poverty*. Centre for Development Policy and Research (CDPR).

Oya, C. (2011). Agriculture in the World Bank: Blighted harvest persists. In K. Bayliss, E. V. Waeyenberge, B. Fine, & International Initiative for Promoting Political Economy (Eds.), *The political economy of development: The World Bank, neoliberalism and development research* (pp. 146–187). Pluto Press.

Oya, C. (2013). Rural wage employment in Africa: Methodological issues and emerging evidence. *Review of African Political Economy*, *40*(136), 251–273. https://doi.org/10.1080/03056244.2013.794728

Oya, C. (2015). Rural labour markets and agricultural wage employment in semi-arid Africa: Evidence from Senegal and Mauritania. In C. Oya & N. Pontara (Eds.),

Rural wage employment in developing countries: Theory, evidence and policy (pp. 37–68). Routledge.

Oya, C., & Pontara, N. (Eds.). (2015). *Rural wage employment in developing countries: Theory, evidence and policy*. Routledge.

Oyinlola, M. A., Adeniyi, O. A., & Raheem, I. D. (2015). Natural resource abundance, institutions and economic growth in Africa. *African Journal of Economic and Sustainable Development*, *4*(1), 34–48. https://doi.org/10.1504/AJESD.2015.068513

Paget, D. (2017a, July 17). Tanzania: Magufuli's mining reforms are a masterclass in political manoeuvring. *African Arguments*. http://africanarguments.org/2017/07/17/tanzania-magufulis-mining-reforms-are-a-masterclass-in-political-manoeuvring/

Paget, D. (2017b, July 27). *All bets are off as Magufuli's resource nationalism moves up a gear in Tanzania*. https://theconversation.com/all-bets-are-off-as-magufulis-resource-nationalism-moves-up-a-gear-in-tanzania-81632

Paget, D. (2017c, November 6). *2 years on: Tanzania's Magufuli isn't a bulldozer. He's a magician.* http://africanarguments.org/2017/11/06/2-years-on-tanzanias-magufuli-isnt-a-bulldozer-hes-a-magician/

Paget, D. (2020a). Mistaken for populism: Magufuli, ambiguity and elitist plebeianism in Tanzania. *Journal of Political Ideologies*, *26*(2), 121–141. https://doi.org/10.1080/13569317.2020.1796345

Paget, D. (2020b). Again, making Tanzania great: Magufuli's restorationist developmental nationalism. *Democratization*, *27*(7), 1240–1260. https://doi.org/10.1080/13510347.2020.1779223

Paget, D. (2020c, October 22). Tanzania's Election: President Magufuli and a struggle of ideas. *ISPI*. https://www.ispionline.it/it/pubblicazione/tanzanias-election-president-magufuli-and-struggle-ideas-27952

Papyrakis, E. (2017). The resource curse - What have we learned from two decades of intensive research: Introduction to the special issue. *The Journal of Development Studies*, *53*(2), 175–185. https://doi.org/10.1080/00220388.2016.1160070

Papyrakis, E., & Gerlagh, R. (2004). The resource curse hypothesis and its transmission channels. *Journal of Comparative Economics*, *32*(1), 181–193. https://doi.org/10.1016/j.jce.2003.11.002

Papyrakis, E., & Gerlagh, R. (2007). Resource abundance and economic growth in the United States. *European Economic Review*, *51*(4), 1011–1039. https://doi.org/10.1016/j.euroecorev.2006.04.001

Parker, J. A. (2015). *Why don't households smooth consumption? Evidence from a 25 million dollar experiment* (Issue 21369). National Bureau of Economic Research, Inc. https://ideas.repec.org/p/nbr/nberwo/21369.html

Pearson, M. N. (1998). *Port cities and intruders: The Swahili Coast, India, and Portugal in the early modern era*. Johns Hopkins University Press.

Pedersen, R. H., Jacob, T., Maganga, F., & Kweka, O. (2016). *Rights to land and extractive resources in Tanzania (1/2): The history*. DIIS, Danish Institute for International Studies. http://hdl.handle.net/10419/148326

Pegg, S., & Zabbey, N. (2013). Oil and water: The Bodo spills and the destruction of traditional livelihood structures in the Niger Delta. *Community Development Journal*, *48*(3), 391–405. https://doi.org/10.1093/cdj/bst021

Perdue, R. T., & Pavela, G. (2012). Addictive economies and coal dependency: Methods of extraction and socioeconomic outcomes in West Virginia, 1997-2009. *Organization & Environment*, *25*(4), 368–384. https://doi.org/10.1177/1086026612464767

Perks, R. (2011). Can I go? – Exiting the artisanal mining sector in the Democratic Republic of Congo. *Journal of International Development*, *23*(8), 1115–1127. https://doi.org/10.1002/jid.1835

Perks, R., & Schneck, N. (2021). COVID-19 in artisanal and small-scale mining communities: Preliminary results from a global rapid data collection exercise. *Environmental Science & Policy*, *121*, 37–41. https://doi.org/10.1016/j.envsci.2021.03.007

Petit, N., & Rizzo, M. (2015). The policy neglect of rural wage employment: The cases of Rwanda and Ethiopia. In C. Oya & N. Pontara (Eds.), *Rural wage employment in developing countries: Theory, evidence and policy*. Routledge.

Pijpers, R. (2014). Crops and carats: Exploring the interconnectedness of mining and agriculture in sub-Saharan Africa. *Futures*, *62*(Part A), 32–39. https://doi.org/10.1016/j.futures.2014.01.012

Pokorny, B., von Lübke, C., Dayamba, S. D., & Dickow, H. (2019). All the gold for nothing? Impacts of mining on rural livelihoods in Northern Burkina Faso. *World Development*, *119*, 23–39. https://doi.org/10.1016/j.worlddev.2019.03.003

Policy Forum. (2010). *Tanzania Governance 2010-2011*. http://www.policyforum-tz.org/sites/default/files/TanzaniaGovernanceReview_0.pdf

Poncian, J., & George, C. (2015). mineral extraction for socio-economic transformation of Tanzania: The need to move from papers to implementation of mining policy and law. *Journal of Social Science Studies*, *2*(2), 160–175. https://doi.org/10.5296/jsss.v2i2.7450

Pontara, N. (2010). *A critical examination of theoretical and methodological approaches to low-income country labour markets: A case study of Mauritania* [Doctoral dissertation]. SOAS, University of London.

Portes, A., Castells, M., & Benton, L. A. (Eds.). (1989). *The informal economy: Studies in advanced and less developed countries*. Johns Hopkins University Press.

Portes, A., & Schauffler, R. (1993). Competing perspectives on the Latin American informal sector. *Population and Development Review*, *19*(1), 33–60. https://doi.org/10.2307/2938384

Potter, C., & Lupilya, A. C. (2016). You have hands, make use of them! Child labour in artisanal and small-scale mining in Tanzania. *Journal of International Development*, *28*(7), 1013–1028. https://doi.org/10.1002/jid.3245

Power, M. (2004). Social provisioning as a starting point for feminist economics. *Feminist Economics*, *10*(3), 3–19. https://doi.org/10.1080/1354570042000267608

Pratt, C. (1976). *The critical phase in Tanzania, 1945-1968: Nyerere and the emergence of a socialist strategy*. Oxford University Press.

Prebisch, R. (1950). *The economic development of Latin America, and its principal problems*. Economic commission for Latin America.

Radley, B., & Geenen, S. (2021). Struggles over value: Corporate–state suppression of locally led mining mechanisation in the Democratic Republic of the Congo. *Review of African Political Economy*, *48*(168), 161–177. https://doi.org/10.1080/03056244.2020.1865902

Randall, S., & Coast, E. (2015). Poverty in African households: The limits of survey and census representations. *The Journal of Development Studies*, *51*(2), 162–177. https://doi.org/10.1080/00220388.2014.968135

Rapsomanikis, G. (2015). *The economic lives of smallholder farmers: An analysis based on household data from nine countries* (p. 40). Food and Agriculture Organisation.

Ravallion, M. (1992). *Poverty comparisons: A guide to concepts and methods*. The World Bank.

Ravallion, M. (2016). *The economics of poverty: History, measurement, and policy*. Oxford University Press.

Ravallion, M., & Bidani, B. (1994). How robust is a poverty profile? *The World Bank Economic Review*, *8*(1), 75–102. https://doi.org/10.1093/wber/8.1.75

Ray, D. (2015). Chapter 8: Poverty and undernutrition. In D. Ray, *Development economics* (pp. 249–292). Princeton University Press.

Reardon, T. (1997). Using evidence of household income diversification to inform study of the rural nonfarm labor market in Africa. *World Development*, *25*(5), 735–747. https://doi.org/10.1016/S0305-750X(96)00137-4

Reuters. (2017, September 24). *Investors wary as Tanzania moves to assert more control over mines*. https://www.reuters.com/article/us-tanzania-mining/investors-wary-as-tanzania-moves-to-assert-more-control-over-mines-idUSKCN1BZ066

Rizzo, M. (2011a). *Rural wage employment in Rwanda and Ethiopia: A review of the current policy neglect and a framework to begin addressing it*. ILO.

Rizzo, M. (2011b). Life is war: Informal transport workers and neoliberalism in Tanzania 1998-2009. *Development and Change*, *42*(5), 1179–1206. https://doi.org/10.1111/j.1467-7660.2011.01726.x

Rizzo, M. (2017). *Taken for a ride: Grounding neoliberalism, precarious labour, and public transport in an African metropolis*. Oxford University Press.

Rizzo, M., & Atzeni, M. (2020). Workers' power in resisting precarity: Comparing transport workers in Buenos Aires and Dar es Salaam. *Work, Employment and Society*, *34*(6), 1114–1130. https://doi.org/10.1177/0950017020928248

Rizzo, M., Kilama, B., & Wuyts, M. (2015). The invisibility of wage employment in statistics on the informal economy in Africa: Causes and consequences. *The Journal of Development Studies*, *51*(2), 149–161. https://doi.org/10.1080/00220388.2014.968136

Roberts, A. (1986). The gold boom of the 1930s in Eastern Africa. *African Affairs*, *85*(341), 545–562. https://doi.org/10.1093/oxfordjournals.afraf.a097817

Roberts, P. (1991). Anthropological perspectives on the household. *IDS Bulletin*, *22*(1), 60–66. https://doi.org/10.1111/j.1759-5436.1991.mp22001009.x

Rodney, W. (1974). *The political economy of colonial Tanganyika, 1890-1939* (Paper Presented to the History Teachers' Conference at the Faculty of Agriculture & Forestry, Morogoro No. 369; p. 39). United Nations Economic Commission for Africa (UNECA), African Institute for Economic Development and Planning (IDEP).

Roever, S., & Rogan, M. (2016). *Improving pay and working conditions from the perspective of the informal economy* [Policy Brief for the UN Secretary-General's High-Level Panel on Women's Economic Empowerment]. Women in Informal Employment: Globalizing and Organizing (WIEGO).

Ross, M. L. (1999). The political economy of the resource curse. *World Politics*, *51*(02), 297–322. https://doi.org/10.1017/S0043887100008200

Ross, M. L. (2001a). *Extractive sectors and the poor*. Oxfam.

Ross, M. L. (2001b). Does oil hinder democracy? *World Politics*, *53*(03), 325–361. https://doi.org/10.1353/wp.2001.0011

Ross, M. L. (2004). How do natural resources influence civil war? Evidence from thirteen cases. *International Organization*, *58*(1), 35–67. https://doi.org/10.1017/S002081830458102X

Ross, M. L. (2012). *The oil curse: How petroleum wealth shapes the development of nations*. Princeton University Press.

Rosser, A. (2006). *The political economy of the resource curse: A literature survey* (IDS Working Paper No. 268). Institute of Development Studies.

Rosser, A. (2007). Escaping the resource curse: The case of Indonesia. *Journal of Contemporary Asia*, *37*(1), 38–58. https://doi.org/10.1080/00472330601104557

Rostow, W. W. (1959). The stages of economic growth. *The Economic History Review*, *12*(1), 1–16. https://doi.org/10.2307/2591077

Rowland, D. T. (2003). *Demographic methods and concepts*. Oxford University Press.

Rowntree, B. S. (1902). *Poverty: A study of town life* (Second Edition). Policy Press.

Rubery, J. (1978). Structured labour markets, worker organisation and low pay. *Cambridge Journal of Economics*, *2*(1), 17–36.

Rutherford, M. (1994). *Institutions in economics: The old and the new institutionalism*. Cambridge University Press.

Saad-Filho, A., & Weeks, J. (2013). Curses, diseases and other resource confusions. *Third World Quarterly*, *34*(1), 1–21. https://doi.org/10.1080/01436597.2012.755010

Sachs, J. D., & Warner, A. (1995). *Natural resource abundance and economic growth*. National Bureau of Economic Research, Inc. https://EconPapers.repec.org/RePEc:nbr:nberwo:5398

Sachs, J. D., & Warner, A. (1999). The big push, natural resource booms and growth. *Journal of Development Economics*, *59*(1), 43–76. https://doi.org/10.1016/S0304-3878(99)00005-X

Sachs, J. D., & Warner, A. (2001). Natural resources and economic development: The curse of natural resources. *European Economic Review*, *45*(4–6), 827–838. http://dx.doi.org/10.1016/S0014-2921(01)00125-8

Sætre, A. S., & Van de Ven, A. H. (2021). Generating theory by abduction. *Academy of Management Review*, *46*(4). https://doi.org/10.5465/amr.2019.0233

Sahn, D. E. (2003). Urban-rural inequality in living standards in Africa. *Journal of African Economics*, *12*(4), 564–597. https://doi.org/10.1093/jae/12.4.564

Sahn, D. E., & Stifel, D. C. (2000). Poverty comparisons over time and across countries in Africa. *World Development*, *28*(12), 2123–2155. https://doi.org/10.1016/S0305-750X(00)00075-9

Saith, A. (2005). Poverty lines versus the poor: Method versus meaning. *Economic and Political Weekly*, *40*(43), 4601–4610. JSTOR.

Sala-i-Martin, X., Doppelhofer, G., & Miller, R. I. (2004). Determinants of long-term growth: A Bayesian averaging of classical estimates (BACE) approach. *American Economic Review*, *94*(4), 813–835. https://doi.org/10.1257/0002828042002570

Sala-i-Martin, X., & Subramanian, A. (2003). *Addressing the natural resource curse: An illustration from Nigeria*. National Bureau of Economic Research, Inc. https://EconPapers.repec.org/RePEc:nbr:nberwo:9804

Samuelson, P. A. (1956). Social indifference curves. *The Quarterly Journal of Economics*, *70*(1), 1–22. https://doi.org/10.2307/1884510

Sarr, M., Bulte, E., Meisner, C., & Swanson, T. (2011). Resource curse and sovereign debt. In *Sovereign debt: From safety to default* (pp. 51–62). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118267073

Sathymala, C. (2016). *Nutrition: Contested meanings: A theoretical and empirical enquiry* [Unpublished Doctoral dissertation]. International Institute of Social Studies, Erasmus University Rotterdam.

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality & Quantity*, *52*(4), 1893–1907. https://doi.org/10.1007/s11135-017-0574-8

Saunders, P., Bradshaw, J., & Hirst, M. (2002). Using household expenditure to develop an income poverty line. *Social Policy & Administration*, *36*(3), 217–234. https://doi.org/10.1111/1467-9515.00248

Scheyvens, R., & Storey, D. (Eds.). (2003). *Development fieldwork: A practical guide*. SAGE.

Schicks, J. (2013). From a supply gap to a demand gap? The risk and consequences of over-indebting the underbanked. In J.-P. Gueyié, R. Manos, & J. Yaron (Eds.), *Microfinance in developing countries: Issues, policies and performance evaluation* (pp. 152–177). Palgrave Macmillan.

Schipani, A. (2021, April 14). *Tanzania's new president turns her back on Magufuli*. https://www.ft.com/content/7549086b-515f-44ea-850c-9795d4a124d6

Schneider, F. (2002). *Size and measurement of the informal economy in 110 countries around the world* (Workshop of Australian National Tax Centre). Australia National University.

Schoneveld, G., Chacha, M., Njau, M., Jønsson, J., Cerutti, P. O., & Weng, X. (2018). *The new face of informality in the Tanzanian mineral economy: Transforming artisanal mining through foreign investment* (p. 76) [Research report]. IIIED.

Schueler, V., Kuemmerle, T., & Schröder, H. (2011). Impacts of surface gold mining on land use systems in Western Ghana. *AMBIO*, *40*(5), 528–539. https://doi.org/10.1007/s13280-011-0141-9

Schwandt, T. A., & Gates, E. F. (2018). Case study methodology. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (Fifth edition, pp. 600–630). SAGE.

Seguino, S., Stevens, T., & Lutz, M. (1996). Gender and cooperative behavior: Economic man rides alone. *Feminist Economics*, *2*(1), 1–21. https://doi.org/10.1080/738552683

Sen, A. (1983). *Poverty and famines*. Oxford University Press. https://doi.org/10.1093/0198284632.001.0001

Sen, A. (1985). *Commodities and capabilities*. North-Holland.

Sen, A. (1993). Capability and well-being. In M. Nussbaum & A. Sen (Eds.), *The quality of life* (pp. 30–53). Oxford University Press. https://doi.org/10.1093/0198287976.003.0003

Sender, J. (2003). Rural poverty and gender: Analytical frameworks and policy proposals. In H.-J. Chang (Ed.), *Rethinking development economics* (pp. 401–420). Anthem Press.

Sender, J., Cramer, C., & Oya, C. (2005). *Unequal prospects: Disparities in the quantity and quality of labour supply in sub-Saharan Africa* (Social Protection Unit No. 0525; Human Development Network). The World Bank.

Sender, J., Cramer, C., & Oya, C. (2018). Identifying the most deprived in rural Ethiopia and Uganda: A simple measure of socio-economic deprivation. *Journal of Eastern African Studies*, *12*(3), 594–612. https://doi.org/10.1080/17531055.2018.1474416

Sender, J., Oya, C., & Cramer, C. (2006). Women working for wages: Putting flesh on the bones of a rural labour market survey in Mozambique. *Journal of Southern African Studies*, *32*(2), 313–333. https://doi.org/10.1080/03057070600656291

Sender, J., & Smith, S. (1990). *Poverty, class, and gender in rural Africa: A Tanzanian case study*. Routledge.

Shelley, F. M. (2015). *The world's population: An Encyclopedia of critical issues, crises, and ever-growing countries*. ABC-CLIO.

Siegel, S., & Veiga, M. M. (2009). Artisanal and small-scale mining as an extralegal economy: De Soto and the redefinition of formalization. *Resources Policy*, *34*(1–2), 51–56. https://doi.org/10.1016/j.resourpol.2008.02.001

Singer, H. W. (1950). The distribution of gains between investing and borrowing countries. *American Economic Review*, *40*(2), 473–485.

Slack, T., & Jensen, L. (2004). Employment adequacy in extractive industries: An analysis of underemployment, 1974–1998. *Society & Natural Resources*, *17*(2), 129–146. https://doi.org/10.1080/08941920490261258

Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. Clarendon Press; Oxford University Press.

Smith, C. (2006). The double indeterminacy of labour power: Labour effort and labour mobility. *Work, Employment and Society*, *20*(2), 389–402. https://doi.org/10.1177/0950017006065109

Society for International Development. (2009). *The extractive resource industry in Tanzania: Status and challenges of the mining sector*. Society for International Development (SID), Regional office for Eastern Africa. https://www.boell.de/sites/default/files/assets/boell.de/images/download_de/SID_Mining_Tanzania.pdf

Spengler, J. J. (1960). *Natural resources and economic growth*. Resources for the Future.

Spiegel, S. J. (2012). Microfinance services, poverty and artisanal mineworkers in Africa: In search of measures for empowering vulnerable groups. *Journal of International Development*, *24*(4), 485–517. https://doi.org/10.1002/jid.1781

Standing, G. (2006). Labour markets. In D. A. Clark (Ed.), *The Elgar companion to development studies* (pp. 323–328). Elgar. https://EconPapers.repec.org/RePEc:elg:eechap:3175_65

Staples, J. (Ed.). (2007). *Livelihoods at the margins: Surviving the city*. Left Coast Press.

Stevano, S. (2014). *Women's work, food and household dynamics: A case study of Northern Mozambique* [Doctoral dissertation]. SOAS, University of London.

Stevano, S. (2020). Small development questions are important, but they require big answers. *World Development*, *127*, 1–3. https://doi.org/10.1016/j.worlddev.2019.104826

Stigler, G., & Becker, G. (1977). De gustibus non est disputandum. *American Economic Review*, *67*(2), 76–90.

Stijns, J.-P. C. (2005). Natural resource abundance and economic growth revisited. *Resources Policy*, *30*(2), 107–130. https://doi.org/10.1016/j.resourpol.2005.05.001

Sumner, A., & Tribe, M. A. (2008). *International development studies: Theories and methods in research and practice*. SAGE.

Sundet, G. (1997). *The politics of land in Tanzania* [Doctoral dissertation]. University of Oxford.

Székely, M., Lustig, N. C., Cumpa, M., & Mejía, J. A. (2000). Do we know how much poverty there is? *IDB Working Paper*, *367*. https://doi.org/10.2139/ssrn.1817236

Tashakkori, A., & Creswell, J. W. (2007). Editorial: Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research*, *1*(3), 207–211. https://doi.org/10.1177/1558689807302814

Tashakkori, A., & Teddlie, C. (Eds.). (2010). *Sage handbook of mixed methods in social & behavioral research* (2nd ed). SAGE Publications.

TCM. (n.d.). *Tanzania Chambers Of Mines*. Retrieved 7 September 2021, from https://tcme.or.tz/mining.html

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE.

The Artisanal and Small-scale Mining Knowledge Sharing Archive. (2018). *ASM Inventory*. http://artisanalmining.org/Inventory

The Citizen. (2015a, November 7). *JPM storms finance ministry*. http://www.thecitizen.co.tz/News/JPM-storms-finance-ministry/1840340-2945972-7w2192/index.html

The Citizen. (2015b, November 24). *Magufuli strikes again: Uhuru Day scrapped*. http://www.thecitizen.co.tz/News/1840340-2969570-xr3dv6z/index.html

The Citizen. (2019a, March 18). *Government plans regional mineral trading centres*. https://www.thecitizen.co.tz/news/-Government-plans-regional-mineral-trading-centres/1840340-5029986-7hxem3z/index.html

The Citizen. (2019b, May 9). *Mineral trading centres start to bear fruit*. https://www.thecitizen.co.tz/news/Mineral-trading-centres-start-to-bear-fruit/1840340-5107280-i5oj41/index.html

The Citizen. (2019c, June 10). *Trading centres boost Tanzania's mining sector*. The Citizen. https://www.thecitizen.co.tz/tanzania/news/trading-centres-boost-tanzania-s-mining-sector-2693818

The Citizen. (2020a, September 10). *VIDEO: Magufuli promise for small-scale miners, tourism*. The Citizen. https://www.thecitizen.co.tz/tanzania/news/video-magufuli-promise-for-small-scale-miners-tourism-2716036

The Citizen. (2020b, November 2). Chadema's Mbowe and Lema arrested for planned demos. *The Citizen*. https://www.thecitizen.co.tz/tanzania/news/chadema-s-mbowe-and-lema-arrested-for-planned-demos-2728758

The East African. (2015, December 17). *Tanzania President Magufuli sacks anti-graft chief*. http://www.theeastafrican.co.ke/news/Tanzania-President-Magufuli-sacks-anti-graft-chief/2558-3000162-format-xhtml-5asb1s/index.html

The East African. (2016, March 22). *Tanzania ghost workers face purge in parastatal payroll clean up*. http://www.theeastafrican.co.ke/news/Tanzania-ghost-workers-face-purge-in-parastatal-payroll-clean-up/2558-3128858-b8l5hs/index.html

The East African. (2017, July 22). *Magufuli says will close all mines if firms delay talks to resolve tax dispute*. https://www.theeastafrican.co.ke/tea/business/magufuli-says-will-close-all-mines-if-firms-delay-talks-to-resolve-tax-dispute-1370070

The Economist. (2016, August 1). *Government bans coal imports*. http://country.eiu.com/article.aspx?articleid=1404504724&Country=Tanzania&topic=Economy&subtopic=Forecast&subsubtopic=Policy+trends&u=1&pid=436018627&oid=436018627&uid=1

The New Times. (2019, February 13). *Tanzanian small-scale miners thank president over removal of nuisance taxes*. https://www.newtimes.co.rw/africa/tanzania-small-scale-miners

Torvik, R. (2002). Natural resources, rent seeking and welfare. *Journal of Development Economics*, *67*(2), 455–470. https://doi.org/10.1016/S0304-3878(01)00195-X

Townsend, P. (2006). *Introduction* (Compendium of best practices in poverty measurement, pp. 15–28). Expert group on poverty statistics (Rio Group).

Tripp, A. M. (1997). *Changing the rules: The politics of liberalization and the urban informal economy in Tanzania*. University of California Press.

Tsui, K. K. (2011). More oil, less democracy: Evidence from worldwide crude oil discoveries. *The Economic Journal*, *121*(551), 89–115. https://doi.org/10.1111/j.1468-0297.2009.02327.x

T.T. (1929). *The Mining Ordinance 1929*. Tangyanika Territory.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*(4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

TZ One. (2015, November). *The speech by H.E. John Pombe Joseph Magufuli officially Inaugurating the 11th Parliament of the United Republic of Tanzania*. http://tz.one.un.org/media-centre/statements/186-the-speech-by-h-e-john-pombe-joseph-magufuli-officially-inaugurating-the-11th-parliament-of-the-united-republic-of-tanzania,

UN Women. (2016). *Mapping study on gender and extractive industries in mainland Tanzania*. United Nations Entity for Gender Equality and the Empowerment of Women.

UNECA. (2011). *Minerals and Africa's development: The international study group report on Africa's mineral regimes*. United Nations Economic Commission for Africa.

UNESCO. (2016, November 27). *United Republic of Tanzania*. http://uis.unesco.org/country/TZ

United Republic of Tanzania. (1967). *The Land Acquisition Act, 1967*.

United Republic of Tanzania. (1979). *The Mining Act, 1979*.

United Republic of Tanzania. (1997a). *The Financial Laws (Miscellaneous Amendments) Act of 1997*.

United Republic of Tanzania. (1997b). *The Mineral Policy of Tanzania*.

United Republic of Tanzania. (1998). *The Mining Act, 1998*.

United Republic of Tanzania. (1999). *The Land Act, 1999*.

United Republic of Tanzania. (2010). *The Mining Act, 2010*.

United Republic of Tanzania. (2013). *2012 Population and Housing Census: Population Distribution by Administrative areas.* National Bureau of Statistics.

United Republic of Tanzania. (2014a). *Integrated Labour Force Survey 2014—Analytical Report*.

United Republic of Tanzania. (2014b). *Tanzania Investment Report: Foreign Private Investment*.

United Republic of Tanzania. (2015). *The Tanzania Extractive Industries (Transparency & Accountability) Act, 2015*.

United Republic of Tanzania. (2017a). *The Finance Act, 2017*.

United Republic of Tanzania. (2017b). *The Written Laws (Miscellaneous Amendments) Act, 2017*.

United Republic of Tanzania. (2017c). *The Natural Wealth and Resources Contracts (Review and Re-negotiation of Unconscionable Terms) Act, 2017*.

United Republic of Tanzania (2018). *The Mining Act [principal legislation] Chapter 123, revised edition of 2018*.

UNSD. (2005). *Designing household survey samples: Practical guidelines* (Series F. No 98) [Handbook]. United Nations Statistics Division.

Van Alstine, J., & Afionis, S. (2013). Community and company capacity: The challenge of resource-led development in Zambia's new copperbelt. *Community Development Journal*, *48*(3), 360–376. https://doi.org/10.1093/cdj/bst019

van der Ploeg, F., & Poelhekke, S. (2017). The impact of natural resources: Survey of recent quantitative evidence. *The Journal of Development Studies*, *53*(2), 205–216. https://doi.org/10.1080/00220388.2016.1160069

Van Maanen, J., Sørensen, J. B., & Mitchell, T. R. (2007). The interplay between theory and method. *Academy of Management Review*, *32*(4), 1145–1154. https://doi.org/10.5465/amr.2007.26586080

Veiga, M. M., & Marshall, B. G. (2019). The Colombian artisanal mining sector: Formalization is a heavy burden. *The Extractive Industries and Society*, *6*(1), 223–228. https://doi.org/10.1016/j.exis.2018.11.001

Verbrugge, B. (2014). *The state of the underground economy: Regulatory complexities, accumulation and informal labour in Compostela Valley's artisanal and small-scale mining (ASM) sector* [Doctoral dissertation]. Ghent Unversity.

Verbrugge, B. (2015). The economic logic of persistent informality: Artisanal and small-scale mining in the southern Philippines. *Development and Change*, *46*(5), 1023–1046. https://doi.org/10.1111/dech.12189

Verbrugge, B. (2016). Voices from below: Artisanal- and small-scale mining as a product and catalyst of rural transformation. *Journal of Rural Studies*, *47*(Part A), 108–116. https://doi.org/10.1016/j.jrurstud.2016.07.025

Verbrugge, H., & Van Wolputte, S. (2015). Just picking up stones: Gender and technology in a small-scale gold mining site. In A. Coles, L. Gray, & J. H. Momsen (Eds.), *The Routledge handbook of gender and development* (pp. 173–184). Routledge, Tayloe & Francis Group.

Viner, J. (1952). *International trade and economic development:* Free Press.

Vogel, C. (2021). The politics of incontournables: Entrenching patronage networks in eastern Congo's mineral markets. *Review of African Political Economy*, *48*(168), 178–195. https://doi.org/10.1080/03056244.2021.1886070

Vyas, S., & Kumaranayake, L. (2006). Constructing socio-economic status indices: How to use principal components analysis. *Health Policy and Planning*, *21*(6), 459–468. https://doi.org/10.1093/heapol/czl029

Wall, M., & Johnston, D. (2008). Counting heads or counting televisions: Can asset-based measures of welfare assist policy-makers in Russia? *Journal of Human Development*, *9*(1), 131–147. https://doi.org/10.1080/14649880701811468

Watkins, M. H. (1963). A staple theory of economic growth. *The Canadian Journal of Economics and Political Science / Revue Canadienne d'Economique et de Science Politique*, *29*(2), 141–158. https://doi.org/10.2307/139461

Weber-Fahr, M., Strongman, J., Kunanayagam, R., McMahon, G., & Sheldon, C. (2001). *Mining and poverty reduction* [Draft for Comments]. World Bank. http://kambing.ui.ac.id/onnopurbo/library/library-ref-ind/ref-ind-1/application/poverty-reduction/prsp/SourceBook/Min0409.pdf

Welsch, H. (2008). Resource abundance and internal armed conflict: Types of natural resources and the incidence of new wars. *Ecological Economics*, *67*(3), 503–513. https://doi.org/10.1016/j.ecolecon.2008.01.004

Weng, X. (2015). *The rural informal economy: Understanding drivers and livelihood impacts in agriculture, timber and mining* (IIED Working Paper). IIED.

Werthmann, K. (2003). The president of the gold diggers: Sources of power in a gold mine in Burkina Faso. *Ethnos*, *68*(1), 95–111. https://doi.org/10.1080/0014184032000060380

Werthmann, K. (2010). Following the hills: Gold mining camps as heterotopias. In U. Freitag & A. von Oppen (Eds.), *Translocality: The study of globalising processes from a southern perspective*. Brill.

Westcott, Cf. N. J. (1982). *The impact of the Second World War on Tanganyika, 1939-49*. University of Cambridge.

Whitehead, A. (1981). I'm hungry mum: The politics of domestic budgeting. In K. Young, C. Wolkowitz, & R. McCullagh (Eds.), *Of marriage and the market: Women's subordination in international perspective* (pp. 93–116). CSE Books.

WHO. (1985). *Energy and protein requirements* [World Health Organization Technical Report Series 724]. World Health Organization.

Wick, K., & Bulte, E. H. (2006). Contesting resources – Rent seeking, conflict and the natural resource curse. *Public Choice*, *128*(3–4), 457–476. https://doi.org/10.1007/s11127-005-9010-z

Wily, E. (1988). *The political economy of African land tenure: A case study from Tanzania.* [Doctoral dissertation]. University of East Anglia.

World Bank. (1994). *Mineral Sector Development Technical Assistance Project: Tanzania* (P-6276-TA).

World Bank. (2006). *Tanzania mining sector review* (No. AB2029). World Bank.

World Bank. (2007). *World development report 2008: Agriculture for Development*. World Bank.

World Bank. (2012). *World Development Report 2013: Jobs*. The World Bank. https://doi.org/10.1596/978-0-8213-9575-2

World Bank. (2015a). *Brief No. 4: Women and artisanal and small-scale mining(ASM)*. The World Bank. https://www.worldbank.org/en/topic/extractiveindustries/brief/gender-in-extractive-industries

World Bank. (2015b). *Tanzania poverty assessment*. https://openknowledge.worldbank.org/handle/10986/2187

World Bank. (2019). *2019 State of the artisanal and small-scale mining sector*. https://www.pactworld.org/state%20of%20asm

World Bank. (2020a). *GDP per capita (constant 2010 US$)*. https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=TZ

World Bank. (2020b). *Tanzania mainland poverty assessment: Part 1—Path to poverty reduction and pro-poor growth*. World Bank. https://openknowledge.worldbank.org/handle/10986/33031

World Bank. (2021a). *GDP growth (annual %)—Tanzania*. https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=TZ

World Bank. (2021b). *Inflation, consumer prices (annual %)—Tanzania | Data*. https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?end=2019&locations=TZ&start=2009&view=chart

Wright, G., & Czelusta, J. (2004a). *Mineral resources and economic development*. Conference on Sector Reform in Latin America Stanford Center for International Development, Stanford.

Wright, G., & Czelusta, J. (2004b). Why economies slow: The myth of the resource curse. *Challenge*, *47*(2), 6–38.

Wright, G., & Czelusta, J. (2007). Resource-based growth past and present. In D. Lederman & W. F. Maloney (Eds.), *Neither curse nor destiny: Natural*

resources and development (pp. 183–212). Stanford University Press and World Bank Publication. https://doi.org/10.1596/978-0-8213-6545-8

Wuyts, M. (1994). Accumulation, industrialisation and the peasantry: A reinterpretation of the Tanzanian experience. *Journal of Peasant Studies*, *21*(2), 159–193. https://doi.org/10.1080/03066159308438544

Wuyts, M. (2001). Informal economy, wage goods and accumulation under structural adjustment theoretical reflections based on the Tanzanian experience. *Cambridge Journal of Economics*, *25*(3), 417–438. https://doi.org/10.1093/cje/25.3.417

Wuyts, M., & Kilama, B. (2014). *The changing economy of Tanzania: Patterns of accumulation and structural change* (Working Paper No. 14/3). REPOA.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (Sixth edition). SAGE.

Zulu, L., & Wilson, S. (2012). Whose minerals, whose development? Rhetoric and reality in post-conflict Sierra Leone. *Development and Change*, *43*(5), 1103–1131. https://doi.org/10.1111/j.1467-7660.2012.01788.x

Appendix A: Details Figure 1.1

Countries included: Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, The Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Capo Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Costa Rica, Cote D'Ivoire, Croatia, Cuba, Curacao, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Eswatini, Ethiopia, Fiji, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Korea, Kosovo, Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Moldova, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, North Macedonia, Norway, Oman, Pakistan, Palau, Panama, Papua Neu Guinea, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Rep Congo, Romania, Russian Federation, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Sweden, Switzerland, Tajikistan, Tanzania, Thailand, The Gambia, The Maldives, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, UAE, Uganda, Ukraine, United Kingdom, United States, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, West Bank and Gaza, Yemen, Zambia, and Zimbabwe.

Data limitations: For UAE, Ukraine, Qatar, and Liberia the GDP per capita series start in 2001; for the Westbank and Gaza in 2002; for Zimbabwe data ends in 2018 and for Venezuela in 2014. With respect to data on resource rents; for Norway the first observation is from 2006 and for Iraq from 2004.

Countries not included because of insufficient data: Afghanistan, American Samoa, Channel Islands, Cayman Islands, Djibouti, Faroe Islands, Gibraltar, Guam, New Caledonia, Democratic People’s Republic of Korea, French Polynesia, Somalia, and South Sudan.

Appendix B: Household Survey Questionnaire (English and Swahili)

English version

A. Identification Variables

Item/serial number	
Name of respondent	
Name of district	
Name of village	
Date of interview	
Household strata (high, medium, or/ low income)	

Final comments:

B. Household Background

1).Ethnic group?		
2). Religion: a). Muslim b). Christian c). Other (specify)		
3). Residence and migration	Yes	No
Is your household originally from this village?		
If not, did you immigrate to this village because of mining activities?		

Has anyone in the household migrated to other areas because of mining activities?		
Do you live in the camp?		
Do you have a residence in this village?		
Is your household living in the village or any other village in Geita district?		
If your household is not living in Geita where does it live?		
If you migrated to Geita where are you from originally (district)?		
When did you migrate to Geita?		

4) Household type a) Monogamous b) Polygamous	
5) For polygamous household attach additional page for demographic information (C) for continuation of serial numbers of household members	

C. Household Roster (Demographics and Livelihood activities)

S.No	Household member, First name	Gender: 1=male; 2=female	Age	Marital status: 1=married; 2=single; 3=divorced; 4=widow	Years of formal education	Highest education attained: 1=none; 2=primary; 3=sec-O-level, 4 = sec-A-level, 5=college, 6=university, 7=underage, 8=others (specify)	Please name ALL livelihood activities/occupations in which you and/or another member of the Household have worked DURING THE PAST 12 MONTHS? 1=crop farming, 2=livestock keeping, 3=fishing, 4=beekeeping, 5=employee large-scale mining, 6=small-scale mining, 7=employee (other than mining), 8=food service, 9=shop, 10=other business, 11=schooling, 12=underage, 13=disabled, 14=others (specify)

S. No	Relationship to household head: 1=husband/male, 2=wife/female, 3=daughter 4=son, 5=relative, 6=worker (domestic), 7=visitor 8=others, (* for household head, R for respondent)	Please indicate ALL WAGED livelihood activties/occupations in which you and/or another member of the Household have worked DURING THE PAST 12 MONTHS: 1=crop farming, 2=livestock keeping, 3=fishing, 4=beekeeping, 5=employee large scale mining, 6=small scale mining, 7=employee (other than mining), 8=food service, 9=shop, 10=other business, 11=schooling, 12=underage, 13=disable, 14=others (specify!)	Please indicate ALL SELF-EMPLOYED livelihood activties/occupations in which you and/or another member of the Household have worked DURING THE PAST 12 MONTHS: 1=crop farming, 2=livestock keeping, 3=fishing, 4=beekeeping, 5=employee large scale mining, 6=small scale mining, 7=employee (other than mining), 8=food service, 9=shop, 10=other business, 11=schooling, 12=underage, 13=disable, 14=others (specify!)

Total number of people living in this household: ……

How many people do normally live in this house?	
Do you normally receive financial help (in the form of money, labour, food or other goods) from other households?	
Is there another person, currently not living in your household, that provides financial aid/sends remittances?	

SECTION I: WHO OWNS WHAT?

D. Housing Characteristics (observational)

Roofing material	Iron sheet, tiles, asbestos
	Thatch grass, mud
	Others (specify)
Floor material	Cement/concrete/tiles
	Earth
	Others (specify)
Walls	Bricks (baked or cement)
	Mud and poles
	Others (specify)
Tenure	Owns the house
	Rented
	Provided by employer
	Belong to relative/friend/ (free)
	Mining camp
	Guest house
	Others (specify)
Main source of drinking water	Piped water in/outside the house

	Piped water in the community
	Private well (protected)
	Public well (protected)
	Unprotected source (well, spring, dam, lake, etc.)
	Buys bottled water
Major fuel for cooking	Fire wood
	Paraffin
	Electricity
	Does not cook
Electricity	Botteled gas
	Connected to public grid
	Not connected
Toilet facility	Flash toilet
	Modern pit latrine
	Non-concrete pit latrine
	No latrine

E. Household Resources & Assets

Resources/Assets	Unit	Quantity
Total land	Acres	
Cultivated land	Acres	
Grazing, fallow, forest land	Acres	
Mining land	Acres	
Livestock		
Cattle	Number	
Goats	Number	

Sheep	Number	
Poultry	Number	
Other (specify)	Number	
Farming machinery	Number	
Farming implements (e.g. ox plough)	Number	
Fishing boat	Number	
Mining machinery and equipment	Number	
Vehicle	Number	
Motorcycle	Number	
Bicycle	Number	
Radio	Number	
Tv/video	Number	
Shop	Number	
Food service	Number	
Bar/local brew	Number	
Other business entity	Number	
Others (specify)	Number	

Mining tools and equipment

Ownership by household member	Number
Jack hammer	
Water pump	
Crusher	
Stamp mills	
Pan	
Shovel	

Chisel	
Blasting	
Machine	
Compressor	
Ventilation fan	
Generator	
Sluice Box	
Pick axe	
Retort	
Others (specify)	Text:

SECTION II: WHO DOES WHAT?

In SECTION C. you mentioned that you and/or another HH member(s) did pursue ASM activities within the last 12 months.

In what year did you first engage in ASM?														
For members engaged in mining indicate months engaged in mining activities fill in information below:														
Member (first name)	Serial No from C.1.	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total months

Did you carry out ANY OTHER livelihood activity besides mining (e.g. farming) during …. (insert month)? Yes/no	
What do household members engaged in mining do when not working in the mines?	
Household member:	Activity when not mining:

Males	
Females	
Children	

F. Tasks Related to Mining

Mine (location)	Ownership	Source	Lease	Does your business/land lord has a license?
	1 = claim holder	1 = inherited from parents/family	1 = has land lease (owner has lease if tenant)	1= Yes
	2 = pit owner	2 = provided by relative/friend	2 = has no lease (owner has lease - if tenant)	2= No
	3 = mine worker	3 = bought it		3 = Do not know
	4 = reprocessing of tailings	4 = rented (tenant)		
	5 = specialised work (specify)	5 = provided by village		
	6 = service-provider (specify)	6 = provided by Gov't		
		7 = contracted		
		8 = Others (specify)		
How many people are working in your mining pit on a usual day?				

II. Other mine information

Details:	Text:
Explanation on specialized work	
Explanation on service person	

If claim holder: indicate the number of pits	
If pit owner: indicate the number of mine workers	

G. Food Calendar and Coping Strategies

	Yes	No
a) Does your household produce and/or own food from a household farm		
b) If not do you buy all of your food?		
c) If yes what percentage of staples is produced by the household?		

	25% or less	26-50%	51-75%	76-100%
Food type				
Staples (grains)				
Meat, milk and other livestock proucts				

d). List 3 most important crops grown by the household (food and cash)

1……..…
2……...……...
3……

e) Fill in below: Indicating food consumption and coping strategies during crisis			
Food consumption and other strategies	Harvest season (or good income)	Off-season	Crisis (e.g. draught, no cash, sickness, low earning from the mine, etc.)
Main types of food eaten			
1.....			
2.....			

3.....			
Other coping strategies (off-season and crisis)			
1. Reduce number (or quantity) of meals			
2. Reduce quality of meals			
3. Reduce other expenditures (specify)			
4. Sell livestock			
5. Sell other assets			
6. Borrow			
7. Sell labour			
8. Food aid			
9. Receive cash from a household member			
10. Lease out mining equipment			
11. Seek employment in other mines			
12. Others (specify)			
Preparations for off-season and crisis:			
1. Store food			
2. Acquire assets			
3. Save cash			
4. Save minerals			
5. Diversify income			
6. migrate for labor			

7. Send children to relative			
8. Others (specify)			

H. Vulnerability - Shocks

Latest incidence of:	Time of occurence: 1. Current, 2. Last six months, 3. Last year, 4. Over a year
Food shortage	
Lack of money	
Low mineral prices	
One household member seriously sick	
AIDS related/long illness of a household meber	
Involved in mine related conflict	
Mine related health problem	
Mine related legal problem	
Mine related theft or loss/damage of property	
Fire incident	
Failure to recover money lent to another person	
Failure to pay back loan from formal or informal source	
Loss of food aid	
Loss of cash remitted by family member, relative or friend	
Member of household quit mining	
Others (specify)	

I. Household Income Sources (combined for all HH members) During the Last 30 days

Source of Income	Income earner (HH Serial No)	Monthly income in TSh (last 30 days)	% share	Waged activity (Yes=1; No=0)	Type of remuneration	Self-employed (Yes=1; No=0)
Food crops (home use and sale)						
Cash/export crops						
Livestock						
Fishing						
Beekeeping						
Mining and related activites						
Salary						
Casual labour						
Shop						
Food Service						
Bar/Local Brew						
Other business (Shop, tailoring, carpentry)						
Remittances from family member or relative						
Other sources (specify)						
Total			100			

J. Expenditure of Income Earned During the Last 30 days

Item	Amount spent in the last 30 days (Sh.)?	Approx. share in %
Food		

Other household expenditures		
Education		
Durable assets		
Housing		
Agriculture		
Livestock		
Mining (license, capital, equipments)		
Means of transport (vehicle, biycle motorcycle)		
Recreation		
Health		
Bank saving		
Remittance		
Others (specify)		
Total (interviewer!)		100
Yesterday's expenditure		100
Typical weekly expenditure		100

K. Rural Wage Employment

On mining activites
Section for claim holders/pit owners (if H. ownership=1/2)
Given you are employing waged labour: How are your employees being remunerated? daily; piece-/task-based; monthly?
How high is this remuneration?
Is there a labour contract?
Section for mine workers (if H. ownership=3/4/5)
Given you are employed as a wage worker: How are you remunerated? daily; piece/task-based; monthly?
How high is this remuneration?

Given you are employed as a wage worker: Is there a contract?
Given you work as a self-employed mine worker:
Indicate number of hours per typical day
Indicate number of days per typical week
What is your relationship with the claim holder/pit owner? Friend; relative; purely business?

L. Assessing Changes on the Household Level With a Focus on ASM

Did you acquire a Primary Mining License (PML) within the last 15 years?
If so, when?
If so, how? (savings, credit, contacts..)
Did you become a pit owner in the last 15 years?
If so, when?
If so, how? (savings, credit, contacts..)
Were you able to accumulate savings from your mining activites? If yes, did you invest this money related to your ASM activities (e.g. mining tools, skills/business training, machinery)?
What is your relationship with the holder of the mineral claim? (friend, relative, stranger, other (specify))
Have you acquired land or were you evicted from where you lived within the last 15 years?
If so, when?
If so, how (savings, credit, contacts..) and why (e.g. type of conflict)?
Are you sub-leasing your mining pit from/to others?
Did you loose your mineral claim or were you evicted from a mining pit within the last 15 years?
If so, when?
If so, why and how? (LSM-ASM conflict, government dispute, conflict with other person)
Did your mining tasks change in the last 15 year? (reprocessing of tailings; specialised work (specify); service-provider (specify), etc.) Please describe how and why.
Did you exit the ASM sector within the last 15 years?

If so, when?
If yes, what were the main reasons?

M. Assessing Support

(To evaluate gap between availability and enforcement of government (extension) services)

Have you experienced support in the following ASM-related activities within the last 15 years?		
Aspect	Yes/No	If yes; who assisted you and how?
Credit access facilitation		
Credit management		
Technical skills training (mining and processing)		
Business management		
Market linkage and information		
Lease facilitation		
Conflict resolution		
Others (specify)		

N. Further Related Questions

Does anyone in the household have a bank account?
Is anyone in the household a member of a SACCOS?
Does anyone in the household belong to an association or cooperative of ASM?
Have you ever (or anyone in the household) received credit for ASM from bank or any formal financial institution during the last 12 months?
Have you ever (or anyone in the household) received credit for ASM from informal sources during the last 12 months?
When selling minerals do you get your payment on spot?
Do you perform any value adding process to your minerals e.g. polishing, cutting, grading, etc? (specify)
Have you (or any member of the household) ever received training related to ASM? Specify
Are you a member of MWAREMA?

Swahili version:

A. Utambulisho

Nambari ya utambulisho	
Jina la mhojiwa	
Jina la wilaya	
Jina la kijiji	
Tarehe ya mahojiano	
Kipato cha kaya (kipato kikubwa, kipato cha kati, kipato cha chini)	

Final comments:

B. Maelezo ya Kaya

1). Je, mhojiwa ni Kabila gani?	
2). Je, mhojiwa ni dini gani? a). mwislamu b). mkristo c). Nyingine (taja)	

3). Makazi na Uhamiaji	Ndiyo	Hapana
Je, kaya yako asili yake ni hapa kijijini?		
Kama hapana, je ulihamia hapa kijijini kwa sababu ya shughuri za uchimbaji madini?		
Je, kuna yeyote katika kaya hii amehamia maeneo mengine kwa sababu ya shughuri za uchimbaji madini?		
Unaishi kwenye kambi?		
Je, una makazi katika kijiji hiki?		

Je, kaya yako inaishi katika kijiji hiki au kijiji kingine chochote ndani ya wilaya ya Geita?		
Kama kaya yako haiishi Geita, Je inaishi wapi?		
Kama ulihamia hapa Geita, Je asili yako ni Wilaya gani?		
Je, ni lini ulihamia hapa Geita?		

4). Aina ya kaya a) mke mmoja b) Wake wengi	
5). Kwa kaya yenye wake wengi ongeza ukurasa kwa ajili ya taarifa ya idada ya watu (C) kwa mwendelezo wa namba za utambulisho wa wanakaya	

C. Taarifa za Kaya (Idadi ya watu na shughuri za kujikimu kimaisha)

Namba ya utambulisho	Mwanakaya, jina la kwanza	Jinsia: 1=mwanaume; 2= mwanamke	Umri	Hali ya ndoa: 1=Nimeoa/kuolewa; 2=hajaoa; 3=Talaka; 4=mjane/mgane	Miaka ya elimu rasmi	Elimu ya juu uliyoipata: 1=hakuna, 2=shule ya msingi, 3=sekondari ya chini, 4=sekondari ya juu, 5=chuo, 6=chuo kikuu, 7=chini ya umri, 8=nyingine (taja)	Tafadhali taja shughuri/kazi zote za kimaisha za kujiajiri ambazo wewe/au mwanakaya mwingine wa kaya hii amewahi kufanya KATIKA KIPINDI CHA MIEZI 12 ILIYOPITA?: 1=Kilimo cha mazao, 2=ufugaji, 3=uvuvi, 4=ufugaji wa nyuki, 5=mwajiriwa kwenye uchimbaji mkubwa, 6=mchimbaji mdogo, 7=mwajiriwa, katika eneo lingine ambalo si uchimbaji, 8=huduma ya chakula, 9=duka, 10=biashara nyingine, 11=bado anasoma, 12=chini ya umri, 13=mlemavu, 14=nyingine (taja)

Namba ya utambulisho	Je, uhusiano wako na mkuu wa kaya ukoje?: 1=mume/mwanume 2=mke/mwanamke 3=mtoto wa kike 4=mtoto wa kiume 5=ndugu 6=mfanyakazi wa ndani 7= mgeni 8=nyingine (taja) (weka * kwa mkuu wa kaya na R kwa mhojiwa)	Tafadhali taja SHUGHURI/KAZI UJIRA ambazo wewe/au mwanakaya mwingine wa kaya hii amewahi kufanya KATIKA KIPINDI CHA MIEZI 12 ILIYOPITA? 1=Kilimo cha mazao, 2=ufugaji, 3=uvuvi, 4=ufugaji wa nyuki, 5=mwajiriwa kwenye uchimbaji mkubwa 6=mchimbaji mdogo, 7=mwajiriwa, katika eneo lingine ambalo si uchimbaji, 8= huduma ya chakula 9=duka, 10=biashara nyingine 11=bado anasoma, 12=chini ya umri 13=mlemavu, 14=nyingine (taja)	Tafadhali taja shughuri/kazi zote za kimaisha za kujiajiri ambazo wewe/au mwanakaya mwingine wa kaya hii amewahi kufanya KATIKA KIPINDI CHA MIEZI 12 ILIYOPITA?: 1=Kilimo cha mazao, 2=ufugaji, 3=uvuvi, 4=ufugaji wa nyuki, 5=mwajiriwa kwenye uchimbaji mkubwa 6=mchimbaji mdogo, 7=mwajiriwa, katika eneo lingine ambalo si uchimbaji, 8= huduma ya chakula, 9=duka, 10=biashara nyingine, 11=bado anasoma 12=chini ya umri, 13=mlemavu, 14=nyingine (taja)

Jumla ya idada ya wanakaya wanaoishi kwenye kaya hii (wamejumlishwa): ……

Je, kwa kawaida ni watu wangapi wanaishi kwenye nyumba hii?	
Kwa kawaida huwa unapata msaada wa kifedha (kwa mfumo wa fedha, kazi, chakula au vitu vingine) kutoka kaya zingine?	
Je, kuna mtu mwingine kwa sasa haishi katika kaya hii ambaye anatoa msaada wa kifedha/ anatuma malipo?	

SECTION I: NANI ANAMILIKI NINI?

D. Sifa za Nyumba (Mwonekano)

Nyumba imeezekwa kwa kutumia nini?	mabati, vigae, mabati ya asbestosi
	Nyasi, makuti, udongo
	Nyingine (taja)
Je, sakafu ya nyumba imejengwa kwa kutumia nini?	Saruji, zege, vigae
	Udongo
	Nyingine (taja)
Kuta za nyumba zimejengwa kwa kutumia nini?	Tofali (kuchoma au saruji)
	Udongo na miti
	Nyingine (taja)
Je, umiliki wa nyumba hii ukoje?	Namiliki mwenyewe
	Nimepanga
	Nimepewa na mwajiri
	Ni ya ndugu/rafiki/(bure)
	Kambi ya uchimbaji
	Nyumba ya kulala wageni
	Nyingine (taja)
Je, ni kipi chanzo kikubwa cha maji ya kunywa?	Maji ya bomba ndani/ nje ya nyumba

	Maji ya bomba la jamii
	Kisima binafsi (kinachotunzwa)
	Kisima cha jamii (kinachotunzwa)
	chanzo kisichotunzwa (kisima, chemchemi, bwawa, ziwa, n.k
Je, ni ipi nishati kubwa ya kupikia?	Kuni
	mshumaa
	Umeme
Umeme	Gesi ya chupa
	Umeme wa msongo wa taifa
	Hakuna umeme
Choo	Choo cha maji
	Choo cha kisasa
	Choo cha shimo kisicho cha saruji
	Hakuna choo

E. Mali za Kaya

Mali	Kipimo	Kiasi
Jumla ya ardhi	Ekari	
Ardhi iliyolimwa	Ekari	
Malisho, ardhi iliyoachwa, eneo la msitu	Ekari	
Eneo la uchimbaji	Ekari	
Mifugo		
Ng'ombe	Idadi	
Mbuzi	Idadi	
Kondoo	Idadi	
Kuku	Idadi	

Nyingine (taja)	Idadi	
Mashine za kilimo	Idadi	
Zana za kilimo (jembe la kuvutwa na ng'ombe)	Idadi	
Mitumbwi ya kuvulia samaki	Idadi	
Mashine na vifaa vya uchimbaji	Idadi	
Chombo cha usafiri/gari	Idadi	
Pikipiki	Idadi	
Baisikeli	Idadi	
Redio	Idadi	
Televisheni	Idadi	
Duka	Idadi	
Huduma ya chakula	Idadi	
Baa / baa ya pombe za kienyeji	Idadi	
Biashara nyingine	Idadi	
Nyingine (taja)	Idadi	

Zana na vifaa vya Uchimbaji

Umiliki kwa mwanakaya	Idadi
Nyundo/jekihamma	
Pampu ya maji	
Kisagio	
Mashine ya kusaga mawe	
Kikaango	
Sepeto	
Patasi	

Baruti	
Mashine	
Kompuresa	
Jeni ya hewa	
Jenereta	
Kifaa cha kuzuia maji	
Shoka	
Chombo cha kubebea kemikali	
Nyingine (taja)	Andika:

SECTION II: Nani anafanya nini?

Ulisema kwamba wewe na/au mwanakaya mwingine alifanya shughuri za uchimbaji mdogo ndani ya miezi 12 iliyopita?

Je, ni mwaka gani ulianza kujihusisha na uchimbaji mdogo?	

Kwa wanakaya waliojihusisha na uchimbaji, ainisha miezi walioanza kujihusisha na shughuri za uchimbaji madini, jaza taarifa hapo chini:

Mwanakaya (jina la kwanza)	Namba za utambulisho kutoka C.1	januari	februari	machi	april	mei	juni	julai	agosti	septemba	oktoba	novemba	disemba	Jumla ya miezi

Je, ulifanya shughuri nyingine yoyote ya kimaisha tofauti na uchimbaji madini (mfano, kilimo) katika kipindi cha…..(ingiza mwezi)? Ndiyo/hapana	

Je, wanakaya wanaojihusisha na uchimbaji madini hufanya kazi gani kipindi ambacho hawafanyi kazi migodini?	
Mwanakaya:	Shughuri tofauti na uchimbaji:
Wanaume (adult)	
Wanawake (adult)	
Watoto (both sexes)	

F. Shughuri Zinazohusiana na Uchimbaji

Mgodi (mahali)	umiliki	chanzo	mkataba wa ukodishaji	Je, biashara yako ina leseni?
	1 = Mwenye leseni	1= Nilirithi kutoka kwa wazazi/familia	1= Ana mkataba wa upangishaji ardhi (mmiliki ana mkataba kama mpangaji)	1= Ndiyo
	2= Mwenye mashimo ya uchimbaji	2= Nilipewa na ndugu/rafiki	2= Hana mkataba wa upangishaji (mmiliki hana mkataba-kama mpangaji)	2= Hapana
	3= Mfanyakazi wa mgodi	3= Nilinunua		3 = Sijui
	4= Usindikaji upya wa makinikia	4= Nilikodi		
	5= Kazi maalumu (taja)	5= Nilipewa na kijiji		
	6= Mtoa huduma (taja)	6= Nilipewa na serikali		
		7= Nilipewa kwa mkataba maalum		
		8 = Nyingine (taja)		
Je, kwa kawaida ni watu wangapi wanafanya kazi katika shimo lako la uchimbaji madini kwa siku?				

II. Taarifa zingine za mgodi

Maelezo ya kina	Andika

Maelezo kuhusu kazi maalumu	
Maelezo kuhusu mtoa huduma	
Kama ni mwenye leseni ya uchimbaji: ainisha idadi ya mashimo	
Kama ni mmiliki wa mashimo ya uchimbaji:ainisha idadi ya wafanyakazi wa mgodi	

G. Kalenda ya Chakula na Njia za Kukabiliana

	Ndiyo	Hapana
a). Je, kaya yako huwa inazalisha chakula chake kutoka kwenye shamba la kaya?		
b). Kama hapana, je huwa unanunua chakula chako chote?		
c) Kama ndiyo, Je, ni asilimia ngapi ya chakula kikuu/nafaka inazalishwa na kaya hii?		

	25% au chini ya	26-50%	51-75%	76-100%
Aina ya chakula				
Nafaka				

Nyama, maziwa and bidhaa zingine za mifugo				
d). Orodhesha mazao makuu 3 yanayoliwa katika kaya hii (mazao ya chakula na biashara)				
1……..… 2……...…… 3……..				

e). Jaza hapo chini: ainisha matumizi ya chakula na njia za kukabiliana kipindi cha uhaba wa chakula			
Matumizi ya chakula na njia zingine	Msimu wa mavuno (au kipindi cha kipato kizuri)	Msimu usiokuwa wa mavuno	Janga (mfano, ukame, uhaba wa fedha, ugonjwa, mapato madogo kutoka kwenye mgodi n.k)
Aina kuu ya vyakula vinavyoliwa			
1.....			
2.....			
3.....			
Njia zingine za kukabiliana(msimu usiokuwa wa mavuno na kipindi cha majanga)			
1. Punguza idadi (kiasi) cha chakula			
2. Kupunguza ubora wa chakula			
3. Kupunguza matumizi mengine (taja)			

4. Sell livestock/ kuuza mifugo			
5. Kuuza mali nyingine			
6. Kukopa			
7. Kufanya kazi ili kujipatia mshahara(kipato)			
8. Msaada wa chakula			
9. Kupokea fedha kutoka kwa mwanakaya			
10. Kukodisha zana za kuchimbia madini			
11. Kutafuta ajira kwenye migodi mingine			
12. Nyingine (taja)			
Maandalizi kwa ajili ya msimu usiokuwa wa mavuno na majanga(uhaba)			
1. Kuhifadhi chakula			
2. Kujipatia mali			
3. Kutumia fedha vizuri			
4. Kuhifadhi madini			
5. Kuwa na njia tofauti za kupata kipato			

6. Kuhama ili kutafuta vibarua			
7. Kupeleka watoto kwa ndugu			
8. Nyingine (taja)			

H. Vulnerability- Majanga

Majanga ya hivi karibuni:	Muda wa kutokea: 1.sasa hivi, 2. miezi 6 iliyopita, 3. mwaka jana, 4. zaidi ya mwaka
Uhaba wa chakula	
Tatizo la kifedha	
Bei ndogo ya madini	
Kuumwa sana kwa mmoja wa mwanakaya	
Mwanakaya kuumwa ugonjwa wa muda mrefu	
Kujihusisha katika mgogoro unaohusu mgodi	
Tatizo la afya katika Mgodi	
Tatizo la kisheria katika Mgodi	
Wizi/upotevu au uharibifu wa mali katika Mgodi	
Tukio la moto	
kushindwa kurudishiwa fedha ulizokopesha kwa mtu mwingine	
Kushindwa kulipa mkopo kutoka chazo rasmi au kisicho rasmi	
Kupoteza msaada wa chakula	
Kupoteza pesa taslimu iliyokuwa inatolewa na mwanafamilia, ndugu au rafiki	
Mwanakaya kuacha uchimbaji wa madini	
nyingine-taja	

I. Vyanzo vya Mapato ya Kaya (Vimewekwa Pamoja kwa Wanakaya Wote)

Chanzo cha mapato	Mwenye kipato (namba ya kitambulisho ya kaya)	Kipato cha kila mwezi katika shilingi za kitanzania(siku 30 zilizopita)	Mgawanyo katika asailimia	hughuri za kulipwa vibarua (ndiyo=1; hapana=0)	Aina ya malipo	Ajira binafsi (ndiyo=1, hapana=0)
Mazao ya chakula (matumizi ya nyumbani na kuuza)						
Mazao ya biashara/kuuza nje ya nchi						
Mifugo						
Uvuvi						
Ufugaji wa nyuki						
Uchimbaji na shughuri zinazohusiana na uchimbaji						
Mshahara						
Kibarua						
Duka						

Huduma ya chakula						
Baa/ pombe za kienyeji						
Biashara zingine (duka, ushonaji, ufundi selemala)						
Msaada wa fedha kutoka kwa mwanafamilia au ndugu						
Vyanzo vingine (taja)						
Jumla			100			

J. Matumizi ya Kipato Kilichopatikana Kutokana na Uchimbaji Mdogo Katika Kipindi cha Siku 30 Zilizopita

Bidhaa	Kiasi cha fedha kilichotumika katika kipindi cha siku 30 zilizopita (sh.)?	Kadiria mgawanyo katika asilimia
Chakula		
Matumizi mengine ya kaya		
Elimu		
Mali za kudumu		
Ujenzi wa nyumba		
Kilimo		
Mifugo		
Uchimbaji (Leseni,zana kubwa)		
Usafiri (gari, baisikeli, pikipiki)		

Burudani/mapumziko		
Afya		
Utunzaji wa fedha katika benki		
Msaada wa kifedha		
Nyingine (taja)		
Jumla (Interviewer!)		100
Matumizi ya jana		100
Matumizi ya kawaida ya kila wiki		100

K. Ajira za Vibarua Vijijijini

Katika shughuri za uchimbaji
Sehemu ya wamiliki wa leseni/Wamiliki wa mashimo (kama H.umiliki=1/2
Chukulia kwamba unaajiri vibarua: Je, ni kwa namna gani utakuwa unawalipa wafanyakazi wako? Kila siku; kwa kipande/kila kazi inayofanyika; kila mwezi?
Je, malipo/mshahara huu ni mkubwa kiasi gani?
Je, kuna mkataba wa kazi?
Sehemu ya wafanyakazi wa Mgodi (kama H. umiliki=3/4/5)
Chukulia umeajiriwa kama kibarua: Je, unalipwaje? Kwa siku, kwa kipande/kwa kazi; kwa mwezi?
Je, malipo haya ni makubwa kiasi gani?
Chukulia umeajiriwa kama kibarua: Je, kuna mkataba?
Weka idadi ya Saa kwa siku
Weka idadi ya siku kwa week
Je, uhusiano wako na mwenye Leseni/mmiliki wa shimo ukoje? Rafiki; ndugu; ni uhusiano wa kibiashara tu

L. Kutathmini Mabadiliko Kwenye Kiwango cha Kaya Tukijielekeza Katika Sekta ya Wachimbaji Wadogo

Je, ulipata leseni ya awali ya uchimbaji madini ndani ya miaka 15 iliyopita?
Kama ni hivyo, ilikuwa Lini?
Kama ndivyo, ni kwa namna gani? (Akiba, mkopo, mawasiliano..)
Je, uliwahi kuwa mmiliki wa shimo katika kipindi cha miaka 15 iliyopita?
Kama ndivyo, ilikuwa Lini?
Kama ndivyo, ni kwa namna gani? (Akiba, mkopo, mawasiliano..)
Je, uliweza kukusanya akiba kutokana na shughuri zako za uchimbaji? kama ndiyo, je, uliwekeza hela hizi kwenye shughuri zinazohusiana na uchimbaji mdogo? (mfano; zana za kuchimbia, mafunzo/mbinu za biashara, mashine)
Je, uhusiano wako na mwenye leseni ya uchimbaji ukoje? (rafiki, ndugu, simjui/mgeni, mwingine (taja)
Je, umeshapata ardhi AU ulifukuzwa kutoka sehemu uliyokuwa unaishi mwanzo katika kipindi cha miaka 15 iliyopita?
Kama ndivyo, ilikuwa lini?
Kama ndivyo, ni kwa namna gani(akiba, mkopo, kufahamiana..) na kwanini (mfano, aina ya mgogoro)?
Je, shimo lako la kuchimbia unakodi kutoka kwa wengine au unawakodishia wengine?
Je, ulipoteza leseni yako ya uchimbaji madini AU ulifukuzwa kwenye shimo la uchimbaji ndani ya miaka 15 iliyopita?
Kama ndivyo, ilikuwa lini?
Kama ndivyo, kwa nini na kwa namna gani? (mgogoro wa wachimbaji wakubwa na wadogo, mgogoro na serikali, mgogoro na mtu mwingine)
Je, shughuri zako za uchimbaji zilibadilika katika kipindi cha miaka 15 iliyopita? (Usindikaji upya wa makinikia, kazi maalumu (taja); mtoa huduma(taja), n.k.) elezea ni kwa namna gani na kwanini
Je, uliwahi kujitoa sekta ya wachimbaji wadogo wadogo katika kipindi cha miaka 15 iliyopita?
Kama ndivyo, ilikuwa lini?
Kama ndiyo, zipi zilikuwa sababu kuu?

M. Kutathmini Msaada

(Kutathmini pengo kati ya upatikanaji na utekelezaji wa huduma za serikali hasa katika uenezi)

Je, umewahi kupata msaada ndani ya kipindi cha miezi 12 iliyopita katika shughuri zinazohusiana na wachimbaji wadogo wadogo?		
Aspect	Ndiyo/hapana	Kama ndiyo; nani alikusaidia na kwa namna gani?
Uwezeshaji wa kupata mkopo		
Usimamizi wa mkopo		
Mafunzo ya ujuzi na kiufundi (uchimbaji na usindikaji)		
Usimamizi wa biashara		
Mtandao wa soko na taarifa		
Uwezeshaji wa ukodishaji		
usuluhishi wa migogoro		
Nyingine (taja)		

N. Maswali Mengine ya Ziada

Je, kuna mwanakaya yeyote ana akaunti ya benki?
Je, kuna mwanakaya yeyote ni mwanachama wa SACCOS?
Je, kuna mwanakaya yeyote ni mwanachama wa ushirika wa wachimbaji wadogowadogo?
Je, wewe au yeyote katika kaya alipokea mkopo kwa ajili ya wachimbaji wadogo wadogo kutoka benki au taasisi yoyote rasmi ya kifedha katika kipindi cha miezi 12 iliyopita?
Je, wewe au yeyote katika kaya alipokea mkopo kwa ajili ya wachimbaji wadogo wadogo kutoka chanzo kisicho rasmi katika kipindi cha miezi 12 iliyopita?
Je, ukiuza madini unapata malipo yako papo kwa papo?
Je, madini yako unayaongezea thamani yoyote mfano, kung'arisha, kukata, kuweka katika madaraja n.k? nyingine (taja)
Je, wewe au mwanakaya yeyote amewahi kupata mafunzo yanayohusiana na wachimbaji wadogo? Taja.
Je, wewe ni mwanachama wa MWAREMA?

Appendix C: Interview Guidelines

Workers

1. Can you tell me a bit about the ASM activities you pursue?
2. Would you say that ASM did allow you to escape from poverty? Why or why not?
3. Where do you see yourself in comparison to other miners in terms of income and wealth? Has your position changed over time?
4. What do you think might be a feasible strategy to escape poverty through ASM? (This could be done e.g., by obtaining a mining license, investing savings stemming from ASM into a mining/non-mining business, and so on.)
5. How do you decide if you dig for yourself or to look for employment at somebody else's pit?
6. Do you think it is possible for a miner to save enough money to obtain a formal mining license? What do you think are the most important factors to get a license?
7. What is the reason you have not acquired a mining license yet? Would you acquire a license if you could pay the fees?
8. In late May 2018 around 7000 new mining permits were issued and have been dispatched to the respective zonal mining offices (https://www.thecitizen.co.tz/News/Commission-approves-7-000-licences/1840340-4584660-kqvsrv/index.html).
   According to the chairman of the Mining Commission, Professor Idris Kikula, over 70% of these newly issued licenses are owned by artisanal and small-scale miners. Did you know about this development and if yes, how? Do you know anyone who managed to obtain a license?
9. Sometimes local middlemen sometimes set fixed prices below market prices linked to the right the right to buy at first. Has this also occurred to you and do you think that the newly established minerals center in Geita town helps you to avoid this?
10. What is your understanding of how the government sees ASM?
11. Is there anything that you consider very important that we did not talk about in our conversation?

Experts

1. Can you tell me a little bit about your work?
2. What do you think about the ability of ASM to reduce poverty over time?
3. The results of our household survey in two mining settlements in Nyarugusu and Mgusu indicate that high rates of household poverty and vulnerability did not change substantially there over the last 15 years. What do you think might explain this?

4. The survey detected that the rural waged ASM population is larger than indicated by national surveys (e.g., ILFS) with a large variance in rural wages. Which policy implications might arise from this? What do you think needs to be done to transform these waged activities into “decent, poverty-reducing jobs”?
5. Our qualitative findings suggest that many miners are not able to make substantial savings to escape from poverty more sustainably. It can be argued that they are trapped in a circle of poverty. What do you think are the reasons that ASM allows households livelihood income improvements in the short run but fails to deliver in the long run?
6. One reoccurring feature in our surveyed ASM communities was the strong reliance of many miners on informal business agreements (e.g., sponsors set fixed prices below market prices before sourcing and have the right to buy at first). What do you think might be a solution to this?
7. What do you think about the recently established mineral market in Geita Town? Who profits and who loses?
8. Do you think that the village government is getting adequate support in the context of enforcing ASM-related labour, environment, and health standards from the state?
9. Do you think there is a need for decentralisation in ASM, and that responsibility should be devolved from the central government to the district level as for instance it is the case with Forestry, Lands, Health, Education? (Follow up Questions: Why do you think this has not happened so far?)
10. What is your perception of the role of the current government in the context of supporting ASM interests versus the interests of LSM?
11. Is there anything that you consider important that we did not talk about in our conversation?

Appendix D: List of Interviewees

Interviews in English were carried out by the author while interviews in Swahili and Sukuma were conducted by Aloyce Seni. The author was present during all non-English interviews.

Workers

Digger 1. 2019. 08 October. Nyarugusu ward.
Digger 2. 2019. 08 October. Nyarugusu ward.
Supervisor. 2019. 08 October. Nyarugusu ward.
Digger 3. 2019.09 October. Nyarugusu ward.
Digger 4. 2019.09 October. Nyarugusu ward.
Crusher 1. 2019. 09 October. Nyarugusu ward.
Crushing Machine Owner. 2019. 09 October. Nyarugusu ward.
Crusher 2. 2019. 09 October. Nyarugusu ward.
Digger 5. 2019. 10 October. Nyarugusu ward.
Crusher 3. 2019. 10 October. Nyarugusu ward.
Digger 6. 2019. 10 October. Nyarugusu ward.
Digger 7. 2019.10 October. Nyarugusu ward.
Digger 8. 2019. 10 October. Nyarugusu ward.
Digger 9. 2019. 10 October. Nyarugusu ward.
Stone Trader. 2019. 11 October. Nyarugusu ward.
Digger 10. 2019. 11 October. Nyarugusu ward.
Crusher 4. 2019. 11 October. Nyarugusu ward.
Pit Owner. 2019. 12 October. Mgusu ward.
Ex-chairmen of Mgusu Miner Association. 2019. 12 October. Mgusu ward.
Digger 11. 2019. 12 October. Mgusu ward.
Sponsor. 2019. 12 October. Mgusu ward.
Digger 12. 2019. 13 October. Mgusu ward.
Digger 13. 2019. 13 October. Mgusu ward.
Digger 14. 2019. 13 October. Mgusu ward.

Experts

Lawyers' Environmental Action Team (LEAT). 2019. 24 September.
Ministry of Mining. 2019. 28 September.
Haki Madini. 2019. 30 September.
Regional Mining Official 2019. 01 October.
MTL Consulting. 2019. 01 October.
STAMICO. 2019. 02 October.
Tanzania Women Miners Association (TAWOMA). 2019. 03 October.
ASM researcher. 2019. 04 October.
Village chairmen. 2019. 08 October.

Member of the Local Government Council. 2019. 08 October.
Chairmen of Village Development Committee. 2019. 09 October.
Mgusu Miners Association. 2019. 12 October.
Member of Village Council. 2019. 12 October.
Geita Regional Miners Association (GEREMA). 2019. 15 October.
Foundation for ASM Development (FADev). 2019. 05 November.