Contents

elements — 101

Preface — VII Aknowledgments — IX Albert Kobina Mensah Chapter 1 Evolution of land reclamation practices and introducing mine land degradation and revegetation in Ghana --- 1 Albert Kobina Mensah Chapter 2 Methods used in soil and human health risk assessment — 29 Albert Kobina Mensah Chapter 3 Identifying risks using sequential extraction analyses, size fractionation, and acid neutralization capacity experiments — 49 Albert Kobina Mensah Chapter 4 Risk identification using remediation incubation experiments, redox microcosm, geospatial analyses, and synchrotron radiation science — 67 Albert Kobina Mensah Chapter 5 Impacts of mining on soil quality —— 83 Albert Kobina Mensah Chapter 6 Topsoil and its management during stockpiling —— 93 Albert Kobina Mensah Chapter 7 Effects of mining on the accumulation and pollution with potentially toxic

Albert Kobina Mensah, Emmanuel Amoakwah, and Ephraim Sekyi-Annan

Chapter 8

The power of plants in cleaning and stabilising potentially toxic elements in mine-contaminated soils —— 111

Albert Kobina Mensah

Chapter 9

Achieving mining sector sustainability —— 143

Albert Kobina Mensah

Chapter 10

Rehabilitation and restoration of degraded mined sites and soils —— 159

Reginald Tang Guuroh and Albert Kobina Mensah

Chapter 11

Case studies in mine land revegetation and remediation employing various approaches —— 171

Albert Kobina Mensah

Chapter 12

Plant species used in revegetation and their corresponding impacts — 189

Albert Kobina Mensah

Chapter 13

Concurrent rehabilitation/revegetation — 203

Albert Kobina Mensah, Bernd Marschner, Sabry M. Shaheen, and Joerg Rinklebe

Chapter 14

Arsenic in a highly contaminated gold mine spoil in Ghana: mobilization and potential of soil amendments to reduce the water-soluble arsenic content and improve soil quality —— 217

Jewel Andoh and Albert Kobina Mensah

Chapter 15

Significance of revegetation of degraded mining sites —— 239

Albert Kobina Mensah Chapter 16 Measuring and monitoring success of post-reclamation efforts —— 259 Prince Addai and Albert Kobina Mensah **Chapter 17** Critical factors for driving successful restoration of degraded mine lands — 273 Emmanuel Dugan and Albert Kobina Mensah Chapter 18 Management of restored mine sites — 291 Joshua Aggrey and Albert Kobina Mensah **Chapter 19** The challenges and strategies for post-mine land restoration efforts in Ghana — 301 Ferdinand Adu-Baffour, Thomas Daum, Albert Kobina Mensah, Konrad Martin, Akwasi Duah-Gyamfi, Frank Rasche, and Regina Birner Chapter 20 A best-fit conceptual framework to enhance phytoremediation scaling —— 315 Albert Kobina Mensah Chapter 21 Phytostabilization of Co, Hg, Mo, and Ni by ryegrass with manure and iron oxides reduced environmental concerns — 335 Orlando Boafo and Albert Kobina Mensah Chapter 22 Identifying research gaps for future reclamation studies —— 363 Albert Kobina Mensah Chapter 23 General conclusions and summaries — 373 References — 385

Index — 447